# Total number of courses having focus on employability/ entrepreneurship/ skill development offered by the University during the year

# 2021-2022



## Maharaja Ganga Singh University

A State University of Higher Education for Dignity and Self-Reliance
Approved by UGC under Section 12B of the UGC Act 1956
NH 15, Jaisalmer Road, Bikaner-334004 (Rajasthan), India
*https://mgsubikaner.ac.in*

There are overall 182 different courses in various programmes offered by the departments in university campus. All the syllabi are attached here with highlighted course content which have focus on employability.

| Name of the Course | Course Code | Year of introduction | Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development |
|---|---|---|---|
| Internet Programming | FS-COMP-MSC-CS-CC-101 | 2021 | Web designing Practice, Project |
| C++ Programming | FS-COMP-MSC-CS-CC-104 | 2021 | Programming Practice, Project |
| Combined Practical | FS-COMP-MSC-CS-CP-106 | 2021 | Software Development and Practice Programming/Database tools etc. |
| Computer Fundamentals | FS-COMP-MSC-CS-FC-105 | 2021 | Practical knowledge of Computers and MS Office |
| Database Management | FS-COMP-MSC-CS-CC-201 | 2021 | Database management, |

| System | | | Project |
|---|---|---|---|
| Operating System | FS-COMP-MSC-CS-CC-203 | 2021 | Linux installation, Administration |
| Ethical Hacking | FS-COMP-MSC-CS-CC-204 | 2021 | Knowlegde of Ethicla Hacking |
| Human and National Values | FS-COMP-MSC-CS-CC-205 | 2021 | Web designing Practice, Project |
| Combined Practical | FS-COMP-MSC-CS-CP-206 | 2021 | Software Development and Practice Programming/Database tools etc. |
| Data Structures | FS-COMP-MSC-CS-CC-301 | 2021 | Data Structures and Algorithm practical, project |
| Java | FS-COMP-MSC-CS-CC-302 | 2021 | Programming Practice, Project |
| Python | FS-COMP-MSC-CS-CE-303( c) | 2021 | Programming Practice, Project |
| Software Engineering & Research Methodology | FS-COMP-MSC-CS-CE-303(a) | 2021 | Software Development and Practice Programming/Database tools etc. |

| Artificial Intelligence | FS-COMP-MSC-CS-CE-303(b) | 2021 | Practice AI algorithms & techniques, Practice Prolog Programming |
|---|---|---|---|
| Combined Practical | FS-COMP-MSC-CS-CP-305 | 2021 | Software Development and Practice Programming/Database tools etc. |
| Data Analysis Using R | FS-COMP-MSC-CS-EO-304(a) | 2021 | Practice data analysis using R Programming, Project |
| Introduction to LaTeX | FS-COMP-MSC-CS-EO-304(b) | 2021 | Practice Latex Programming, Project |
| Natural Language Processing | FS-COMP-MSC-CS-EO-304(c) | 2021 | Practical knowledge of Natural language processing tools and techniques |
| Introduction to Cyber Security | FS-COMP-MSC-CS-EO-304(d) | 2021 | Cyber Security techniques, knowledge of Indian IT Act 2000 |

| Computer Graphics & Multimedia | FS-COMP-MSC-CS-CC-401 | 2021 | Practice Computer Graphics Algorithms & OpenGL |
|---|---|---|---|
| Android Programming | FS-COMP-MSC-CS-CC-402 | 2021 | Designing Android Apps using Android Studio |
| Cloud Computing | FS-COMP-MSC-CS-CE-403(a) | 2021 | Web designing Practice, Project |
| Internet of Things | FS-COMP-MSC-CS-CE-403(b) | 2021 | Learning Using Cloud services, working on cloud, maintain data on cloud |
| Big Data & Data Mining | FS-COMP-MSC-CS-CE-403(c) | 2021 | practical aspects of using IOT using Raspberry Pi |
| Machine Learning | FS-COMP-MSC-CS-CE-403(d) | 2021 | Practice of various machine learning algorithms |
| Combined Practical | FS-COMP-MSC-CS-CP-405 | 2021 | Software Development and Practice |

| | | | Programming/Database tools etc. |
|---|---|---|---|
| Research Project | FS-COMP-MSC-CS-EO-404(a) | 2021 | Research Project |
| Review | FS-COMP-MSC-CS-EO-404(b) | 2021 | Case Study |
| Dissertation | FS-COMP-MSC-CS-EO-404(c) | 2021 | Dissertation |
| Internship | FS-COMP-MSC-CS-EO-404(d) | 2021 | Internship in an IT firm |
| Data Structures | FS-COMP-MCSLE-CC-101 | 2021 | Data Structures and Algorithm practical, project |
| Java | FS-COMP-MCSLE-CC-102 | 2021 | Programming Practice, Project |
| Software Engineering & Research Methodology | FS-COMP-MCSLE-CC-103a | 2021 | Software Development and Practice Programming/Database tools etc. |
| Artificial Intelligence | FS-COMP-MCSLE-CC-103b | 2021 | Practice AI algorithms & techniques, Practice Prolog Programming |

| Data Analysis Using R | FS-COMP-MCSLE-CC-105a | 2021 | Practice data analysis using R Programming, Project |
|---|---|---|---|
| LaTeX: a document preparation system | FS-COMP-MCSLE-CC-105b | 2021 | Practice Latex Programming, Project |
| Computer Graphics & Multimedia | FS-COMP-MSC-LE-CC-201 | 2021 | Knowledge of Computer graphics tools, Hands-on Practice of Blender |
| Android Programming | FS-COMP-MSC-LE-CC-202 | 2021 | Designing Android Apps using Android Studio |
| Cloud Computing | FS-COMP-MSC-LE-CC-203 (a) | 2021 | Hands-on practice for using Cloud environment |
| Internet of Things | FS-COMP-MSC-LE-CC-203 (b) | 2021 | Using Raspberry Py for development of Iot device |
| Big Data & Data | FS-COMP-MSC- | 2021 | hando on |

| Mining | LE-CC-203 (c) | | practice to use Hadoop and other data mining tools |
|---|---|---|---|
| Machine Learning | FS-COMP-MSC-LE-CC-203 (d) | 2021 | Using Machine learning tools and techniques |
| Natural Language Processing | FS-COMP-MSC-LE-CC-204(a) | 2021 | Programming Practice, Project |
| Introduction to Cyber Security | FS-COMP-MSC-LE-CC-204(b) | 2021 | Practical knowledge of Natural language processing tools and techniques |
| Combined Practical & Project | FS-COMP-MSC-LE-CC-205 | 2021 | Cyber Security techniques, knowledge of Indian IT Act 2000 |
| Moral Values | FS-COMP-MSC-LE-CC-206 | 2021 | inclulcate life skills and moral values in the student |
| Programming with C++ | PGDCA-102 | 2019 | Programming Practice, Project |
| Database System | PGDCA-103 | 2019 | Database management, |

| | | | Project |
|---|---|---|---|
| Operating System | PGDCA-104 | 2019 | Linux installation, Administration |
| Research Project/ Case Study | PGDCA-106 | 2019 | Research Project/ Case Study |
| C++ Lab | PGDCA-107 | 2019 | Programming Practice, Project |
| DBMS Lab | PGDCA-108 | 2019 | Database management, Project |
| Cyber Crime, Cyber Laws and IPR | MCSEC 102 | 2019 | Learning Cyber Crime, Cyber Laws and IPR |
| C++ and Data Structures | MCSEC 104 | 2019 | Data Structures and Algorithm practical, project |
| Combined Practical | MCSEC 105 | 2019 | Practice Programming/Database security tools etc. |
| Information Security and Cryptography | MCSEC 201 | 2020 | Practice Information Security tools. Dept has |

| | | | complete module and set of excercises for Information Security |
|---|---|---|---|
| Ethical Hacking | MCSEC 202 | 2020 | Practice Ethical Hacking tools. Dept has complete module and excercises for Information Security |
| DBMS | MCSEC 203 | 2020 | Database management, Project |
| Python | MCSEC 204 | 2020 | Programming Practice, Project |
| Combined Practical | MCSEC 205 | 2020 | Practice Programming/Database security tools etc. |
| Cyber Forensics, Audit and Investigation | MCSEC 301 | 2020 | Cyber Forensics, Audit and Investigation |
| Biometric Security | MCSEC 302 | 2020 | Learn and practice Biometric |

| | | | Security Algorithms |
|---|---|---|---|
| Wireless LAN and Mobile Computing | MCSEC 303 | 2020 | learn Mobile computing |
| Operating Systems | MCSEC 304 | 2020 | Linux installation, Administration |
| Combined Practical | MCSEC 305 | 2020 | Practice Programming/Database security tools etc. |
| Malware Analysis | MCSEC 401 | 2020 | Practice malware analysis and vulnerability check using various tools. |
| Mobile and wireless security | MCSEC 402 | 2020 | learning and practice Mobile and wireless security |
| Intrusion Detection and Prevention Systems | MCSEC 403 | 2020 | Learn Intrusion Detection and Prevention Systems, Practice Wireshark and |

| | | | other IDS/IPS |
|---|---|---|---|
| Combined Practical | MCSEC 405 | 2020 | Practice Programming/Database security tools etc. |
| History of Indian Arts -I | FA-D&P-CC-102 | 2021 | Knowledge of Indian Arts |
| Landscape (Monochrome) Practical | FA-D&P-CC-103 | 2021 | Landscape (Monochrome) Practical |
| Portrait Study (Monochrome) Practical | FA-D&P-CC-104 | 2021 | Portrait Study (Monochrome) Practical |
| History of Indian Arts -II | FA-D&P-CC-202 | 2021 | Knowledge of Indian Arts |
| Landscape (Coloured) Practical | FA-D&P-CC-203 | 2021 | Landscape (Coloured) Practical |
| Portrait Study (Coloured) Practical | FA-D&P-CC-204 | 2021 | Portrait Study (Coloured) Practical |
| History and Philosophy of Modern Art-I | FA-D&P-CC-301 | 2021 | Knowledge of Modern Art |
| History of | FA-D&P-CC-302 | 2021 | Knowledge of |

| | | | |
|---|---|---|---|
| Western Art - I | | | Western Art |
| Composition (Figurative) Practical | FA-D&P-CE-303A | 2021 | Composition (Figurative) Practical |
| Print Making (Leno) Practical | FA-D&P-CE-303B | 2021 | Print Making (Leno) Practical |
| Nature Study (Monochrome) Practical | FA-D&P-CE-304A | 2021 | Nature Study (Monochrome) Practical |
| Creative Still Life (Monochrome) Practical | FA-D&P-CE-304B | 2021 | Creative Still Life (Monochrome) Practical |
| Life Study (Monochrome) Practical | FA-D&P-CE-304C | 2021 | Life Study (Monochrome) Practical |
| 2D Design (Monochrome) Practical | FA-D&P-CE-305A | 2021 | 2D Design (Monochrome) Practical |
| Rendering (Monochrome) Practical | FA-D&P-CE-305B | 2021 | Rendering (Monochrome) Practical |
| History and Philosophy of Modern Art-II | FA-D&P-CC-401 | 2021 | Art in Education & Society |

| History of Western Art - II | FA-D&P-CC-402 | 2021 | History of Western Art |
|---|---|---|---|
| Composition (Non-Figurative) Practical | FA-D&P-CE-403A | 2021 | Composition (Non-Figurative) Practical |
| Print Making (Wood) Practical | FA-D&P-CE-403B | 2021 | Print Making (Wood) Practical |
| Nature Study (Coloured) Practical | FA-D&P-CE-404A | 2021 | Nature Study (Coloured) Practical |
| Creative Still Life (Coloured) Practical | FA-D&P-CE-404B | 2021 | Composition (Pictorial) |
| Life Study (Coloured) Practical | FA-D&P-CE-404C | 2021 | Creative Still Life (Coloured) Practical |
| 2D Design (Coloured) Practical | FA-D&P-CE-405A | 2021 | 2D Design (Coloured) Practical |
| Rendering (Coloured) Practical | FA-D&P-CE-405B | 2021 | Rendering (Coloured) Practical |
| Microbial Genetics and Genetic Engineering | FS-MIC-CC-104 | 2021 | Genetic engineering, cloning, genomic library |

| | | | construction etc |
|---|---|---|---|
| Bioinstrumentation | FS-MIC-CC-202 | 2021 | Use of different techniques which could help in the establishment of new Laboratories |
| Industrial and food Microbiology | FS-MIC-CC-204 | 2021 | Bioreactor design and fermentation processes, isolation selection and screening of industrially important microorganisms. The production process of various industrially important microbial products. |
| Microbial Ecology and Environmental | FS-MIC-CC-402 | 2021 | Wastewater treatment processes, microbial |

| | | | |
|---|---|---|---|
| Biotechnology | | | assessment of water quality etc. |
| Soil and Agricultural Microbiology | FS-MIC-CC-302 | 2021 | Production Technology for biofertilizers, microbial pesticides, formulation of insecticides, rhizosphere microbiology and study of various plant diseases |
| Basics of Medical Laboratory Techniques | FS-MIC-OE-304B | 2021 | Introduction and application of various techniques required for functioning of clinical and non clinical Laboratories |
| Foundation of Yoga | PGDYN-1 | 2019 | Foundational Knowledge of Yoga |
| Basics of Naturopathy | PGDYN-2 | 2019 | Foundational Knowledge of |

| | | | Naturopathy |
|---|---|---|---|
| Human Anatomy & Physiology | PGDYN-3 | 2019 | Anatomy Knowledge of human body |
| PGDYN-4 Yogic management for Diseases | PGDYN-4 | 2017 | Therapy Knowledge of Yoga |
| PGDYN-P Practical | PGDYN-P | 2017 | Practical Knowledge of Yoga |
| Dissertation/Project Work/ clinical project / case study / & Viva | PGDYN-D | 2017 | Practical Knowledge of Therapy |
| Philosophical Background of Yoga | MYS-1 | 2017 | Philosophical Knowlede of Yoga |
| Principal Upanishads & Yoga Vasishtha | MYS-2 | 2017 | Ancient Yoga Knowledge |
| Yoga and Health | MYS-3 | 2017 | Therapy Knowledge of Yoga |
| Diet and Dietary Management for Common | MYS-4 | 2018 | Therapy Knowledge of Yoga |

| | | | |
|---|---|---|---|
| Diseases | | | |
| Combined Practical | MYS-I-P | 2018 | Practical Knowledge of Yoga |
| Sadana and Theory of HathyogaAvamPatanjali Yoga | MYS-5 | 2018 | Therapy Knowledge of Yoga |
| Psychology and its Relevance to Yoga | MYS-6 | 2018 | Therapy Knowledge of Yoga |
| Study of Yogic practices | MYS-7 | 2018 | Therapy Knowledge of Yoga |
| Research Methods and Statistic in Yoga Education | MYS-8 | 2018 | Research Knowledge |
| Combined Practical | MYS-II-P | 2018 | Practical Knowledge of Yoga |
| Dissertation/project/training/review/clinical project/internship/case study | MYS-D | 2018 | Practical Knowledge of Yoga |

| Historical Background of Yoga | FPE-YOG-01-CC- 01 | 2018 | Foundational Knowledge of Yoga |
|---|---|---|---|
| Theoretical study of Yogic Practices | FPE-YOG-01-CC- 02 | 2018 | Anatomy Knowledge of human body |
| Patanjali Yoga | FPE-YOG-01-CC -03 | 2018 | Ancient Yoga Knowledge |
| Human Anatomy & Physiology–I | FPE-YOG-01-CC- 04 4011 | 2021 | Anatomy Knowledge of human body |
| Basics of Yoga | FPE-YOG-01-CF-01 | 2021 | Ancient Yoga Knowledge |
| Practical | FPE-YOG-01-P 01 | 2021 | Practical Knowledge of Yoga |
| Diet & Dietary Management | FPE-YOG-02-CC 01 4011 | 2021 | Diet Management Knowledge |
| Sadhna & Theory of Hath Yoga | FPE-YOG-02-CC-02 | 2021 | Ancient Yoga Knowledge |
| Yogic Concepts in Upanishads | FPE-YOG-02-CC-03 | 2021 | Foundational Knowledge of Yoga |
| Human anatomy | FPE-YOG-02- | 2021 | Ancient Yoga |

| & Physiology-II | CC-04 | | Knowledge |
|---|---|---|---|
| Human and National Values | FPE-YOG-02-CF-01 | 2021 | National Values |
| Practical | FPE-YOG-02-P-01 | 2021 | Practical Knowledge of Yoga |
| Yogic management for Diseases | FPE-YOG-03-CC-01 | 2021 | Therapy Knowledge of Yoga |
| Basics of Naturopathy | FPE-YOG-03-CC-02 | 2021 | Knowledge of Naturopathy methods |
| General Psychology | FPE-YOG-03-CE-01 | 2021 | Foundatinoal Knowledge of psychology |
| Yoga in ancient Text | FPE-YOG-03-CE-02 | 2021 | Foundational Knowledge of Yoga |
| Indian Philosophy Relevant to Yoga | FPE-YOG-03-EO-01 | 2021 | Foundational Knowledge of Yoga |
| Ayurveda, Swasthavritta & Diet | FPE-YOG-03-EO-02 | 2021 | Foundational Knowledge of Ayurved |
| Practical | FPE-YOG-03-P | 2021 | Practical Knowledge of |

| | 01 | | Yoga |
|---|---|---|---|
| Research methods and Statistic in Yoga Education | FPE-YOG-04-CC-01 | 2021 | Research Knowledge |
| Dissertation OR Research Project OR Review OR Case Study | FPE-YOG-04-D-01 | 2021 | Practical Knowledge of Yoga |
| Teaching Methodology of Yoga Practice | FPE-YOG-04-EO-01 | 2021 | Therapy Knowledge of Yoga |
| Yoga & Stress Management | FPE-YOG-04-EO-02 | 2021 | Therapy Knowledge of Yoga |
| FPE YOG 04 P 01 4011: Practical | FPE-YOG-04-P-01 | 2021 | Practical Knowledge of Yoga |
| BASIC PRINCIPLE OF YOGA AND ITS RELEVANCE | BYS-1 | 2021 | Foundational Knowledge of Yoga |
| HUMAN BIOLOGY andNUTRITION RELATED BIOCHEMISTR | BYS-2 | 2021 | Nutriotion knowledge |

| Y | | | |
|---|---|---|---|
| INDIAN EPICS | BYS-3 | 2021 | Foundational Knowledge of Yoga |
| Practicals | BYS-I-P | 2019 | Practical Knowledge of Yoga |
| Yoga therapy(Modern & Ancient) | BYS-4 | 2019 | Ancient Yoga Knowledge |
| YOGA & SPIRITUALITY | BYS-5 | 2019 | Foundational Knowledge of Yoga |
| Patanjal YOGA TEXTS | BYS-6 | 2019 | Ancient Yoga Knowledge |
| Practicals | BYS-II-P | 2019 | Practical Knowledge of Yoga |
| Brain-Psychology And Naturopathy | BYS-7 | 2019 | Knowledge of Human Brain and Naturopathy methods |
| NATURE CURE METHODS AND PRACTICE | BYS-8 | 2019 | Knowledge of Naturopathy methods |

| STRESS MANAGEMENT AND YOGA RESEARCH | BYS-9 | 2019 | Handling Stress and Research Knowledge |
|---|---|---|---|
| Practical | BYS-III-P | 2019 | Practical Knowledge of Yoga |
| B.A. LL.B. (H) | Paper 8.5 and 8.6 Moot Court | 2019 | Moot Court, Seminar |
| LL.B. | Moot Court | 2019 | Moot Court, Seminar |
| LL.M. | Moot Court, Seminar | 2019 | Moot Court, Seminar |
| PGDFS | Foresnsic Laboratory Practical | 2019 | Foresnsic Laboratory Practical |
| Foundations of Library and Information Science | FE-LIS-CF-100 | 2019 | Knowledge of Library functioning |
| Knowledge Organization: Classification (Theory) | FE-LIS-CC-101 | 2017-18 | Knowledge of Classification of Books |
| Knowledge Organization: | FE-LIS-CC-102 | 2019-20 | Hands On practice of |

| | | | |
|---|---|---|---|
| Classification (Practical) | | | Classification of Books |
| Information and Communication Technology (Theory) | FE-LIS-CC-103 | 2021 | Knowledge of ICT useful for library management |
| Information and Communication Technology (Practical) | FE-LIS-CC-104 | 2021 | Hands -on Practice of ICT tools useful for library management |
| Seminar | FE-LIS-CC-105 | 2021 | Seminars |
| Skill Enhancement : Internship | FE-LIS-CC-106 | 2021 | On-site training of Lbirary Functions |
| National and Human Value | FE-LIS-CF-200 | 2021 | To inclulcate in humans Human values and Thoghts related to National Pratidge |
| Knowledge Organization: Cataloguing (Theory) | FE-LIS-CC-201 | 2021 | Knowledge of Cataloguing of Books |
| Knowledge Organization: | FE-LIS-CC-202 | 2021 | Hands On practice of |

| Cataloguing (Practical) | | | Cataloguing of Books |
|---|---|---|---|
| Management of Academic Library & Information System | FE-LIS-CC-203A | 2021 | On-site training of LbiraryInformati on Systems |
| Management of Public Library& Information System | FE-LIS-CC-203B | 2021 | On-site training of LbiraryInformati on Systems |
| Information Sources &Systems in Sciences | FE-LIS-CC-204A | 2021 | Knowledge of Knowledge bases, datasets and repositories for Science stream |
| Information Sources & Systems in Social Sciences | FE-LIS-CC-204B | 2021 | Knowledge of Knowledge bases, datasets and repositories for Social Science stream |
| Seminar | FE-LIS-CC-205 | 2021 | Seminars |
| Environmental Technology | FS-ENV-CC-301 | 2021 | Practical aspects of various environmental |

| | | | technology & tools |
|---|---|---|---|
| Environmental Impact Assessment | FS-ENV-CC-302 | 2021 | Practical aspects of various environmental Impact assessment tools nad technique |
| Climate Science | FS-ENV-EO-304(a) | 2021 | Knowledge of various environmental Impact assessment tools nad technique |
| Disaster Management | FS-ENV-EO-304(b) | 2021 | Knowledge of Natural Resources and Management |
| Natural Resources and Management | FS-ENV-CC-401 | 2021 | Tools & techniques for Natural Resources and Management |
| Environmental Impact Assessment | FS-ENV-CC-402(a) | 2021 | Field Knowlegde of Biodiversity and Conservation |

| Biodiversity and Conservation | FS-ENV-CC-402(b) | 2021 | Field Knowledge of Biodiversity and Conservation |
|---|---|---|---|
| Environmental Issues and Awareness | FS-ENV-CC-403(a) | 2021 | Knowledge of Environmental Issues and Awareness |
| Waste Management | FS-ENV-CC-403(b) | 2021 | Experiments for Waste Management techniques |
| Practical | FS-ENV-CC-405 | 2021 | Experimental Study of various environmental issues and techniques |
| Paper ESCC 404 Dissertations | FS-ENV-CC-404 | 2021 | Research Projects on environmental issues |

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BIKANER

# M. G. S. UNIVERISTY, BIKANER

# SYLLABUS

**M.Sc.(Computer Science)**
**(Semester System)**
**Session-2021-22**

# Maharaja Ganga Singh University

# Bikaner

# Masters in Computer Science (Semester System)
Choice Based Credit System

**Learning Outcome-based  Curriculum Framework (LOCF)**

**for**

**M.Sc.(Computer Science)**

**Session 2021-22**
**Exam 2021 and 2022**

**Department of Computer Science**
**Maharaja Ganga Singh University, Bikaner**

# Masters in Computer Science (Semester System)
Choice Based Credit System

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# Masters in Computer Science (Semester System)
## Choice Based Credit System

## Background

Considering the curricular reforms as instrumental for desired learning outcomes, all the academic departments of Maharaja Ganga Singh University Bikaner, made a rigorous attempt to revise the curriculum of postgraduate programs in alignment with National Education Policy-2020 and UGC Quality Mandate for Higher Education Institutions-2021. The process of revising the curriculum could be prompted with the adoption of the "Comprehensive Roadmap for Implementation of NEP-2020". The Roadmap identified the key features of the Policy and elucidated the Action Plan with well-defined responsibilities and an indicative timeline for major academic reforms.

The process of revamping the curriculum started with a series of webinars and discussions conducted by the University to orient the teachers about the key features of the Policy, enabling them to revise the curriculum in sync with the Policy. Proper orientation of the faculty about the vision and provisions of NEP-2020 made it easier for them to appreciate and incorporate the vital aspects of the Policy in the revised curriculum focused on creating holistic thoughtful, creative, and well-rounded individuals equipped with the key 21st-century skills 'for the development of an enlightened, socially conscious,  knowledgeable, and skilled nation'.

With NEP-2020 in the background, the revised curricula articulate the spirit of the Policy by emphasising upon - an integrated approach to learning; innovative pedagogies and assessment strategies; multidisciplinary and cross-disciplinary education; creative and critical thinking; ethical and Constitutional values through value-based  courses; 21st century capabilities across the range of disciplines through life skills, entrepreneurial and professional skills; community and constructive public engagement; social, moral, and environmental awareness; Organic Living and Global Citizenship Education (GCED); holistic, inquiry-based, discovery-based , discussion-based and analysis-based learning; exposure to Indian knowledge system, cultural traditions and literature through relevant courses offering "Knowledge of India, fine blend of modern pedagogies with indigenous and traditional ways of learning; flexibility in course choices, student-centric participatory learning;  imaginative and flexible curricular structures to enable creative combinations of disciplines for study; offering  multiple entry and exit points, alignment of Vocational courses with the International Standard Classification of Occupations maintained  by the International Labor Organization; breaking the silos of disciplines; integration of extra-curricular and curricular aspects, exploring internships with local industry, businesses and artists and craft persons; closer collaboration between industry and higher education institutions for technical, vocational, and science programs, and formative assessment tools to be aligned with the learning outcomes, capabilities, and dispositions as specified for each course. The university has also developed a consensus on Blended Learning with 10% component of online teaching and 60% face-to-face classes for each program.

The revised curricula of various programs could be devised with concerted efforts of the faculty, Heads of the Departments, and the Deans of Schools of Study.  The draft prepared by each department was discussed in a series of discussion sessions conducted at the Department, School, and University level. The leadership of the University has been a driving force behind the entire exercise of developing the uniform template and structure for the revised curriculum. The Vice-Chancellor of the University conducted series of meetings with Heads and Deans to deliberate upon the vital parameters of the revised curriculum to formulate a uniform template featuring Background, Programme Outcomes,  Programme

# Masters in Computer Science (Semester System)
## Choice Based Credit System

Specific Outcomes, Postgraduate Attributes, Structure of Masters Course, Learning Outcome Index, Semester-wise Courses and Credit Distribution, Course-level Learning Outcomes, Teaching-Learning Process, Blended Learning, Assessment and Evaluation, Keywords, References, and Appendices. The experts of various Board of Studies and School Boards contributed to a large extent in giving the final shape to the revised curriculum of each program.

To ensure the implementation of curricular reforms envisioned in NEP-2020, the University has decided to implement various provisions in a phased manner. Therefore, the curriculum may be reviewed annually so as to gradually include all relevant provisions of NEP-2020.

# Masters in Computer Science (Semester System)
Choice Based Credit System

## Program Outcomes

On completing Masters in the Faculty of Science, the students shall be able to realize the following outcomes:

| PO | Description |
|---|---|
| PO1 | Acquired knowledge with facts and figures related to various subjects in pure sciences such as Physics, Chemistry, Botany, Zoology, Mathematics, etc. |
| PO2 | Understood the basic concepts, fundamental principles, and scientific theories related to various scientific phenomena and their relevance in day-to-day life. |
| PO3 | Acquired the skills in handling scientific instruments, planning, and performing laboratory experiments The skills of observations and drawing logical inferences from the scientific experiments. |
| PO4 | Analyzed the given scientific data critically and systematically and the ability to draw objective conclusions. |
| PO5 | Been able to think creatively (divergent and convergent) to propose novel ideas in explaining facts and figures or providing new solutions to problems. |
| PO6 | Realized how developments in any science subject help develop other science subjects and vice-versa and how interdisciplinary approach helps provide better solutions and new ideas for sustainable outcomes. |
| PO7 | Developed a scientific outlook concerning science subjects and all aspects related to life. |
| PO8 | Realized that knowledge of subjects in other faculties such as humanities, performing arts, social sciences, etc., can have greatly and effectively influence, which inspires in evolving new scientific theories and inventions. |
| PO9 | Imbibed ethical, moral, and social values in personal and social life, leading to a highly cultured and civilized personality. |
| PO10 | Developed various communication skills such as reading, listening, speaking, etc., which will help express ideas and views clearly and effectively. |
| PO11 | Realized that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude and other necessary qualities leads towards a successful life. |

# Masters in Computer Science (Semester System)
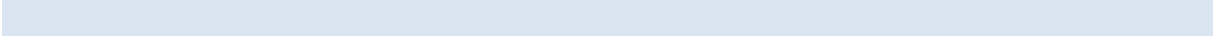Choice Based Credit System

## Program Specific Outcomes (PSO)

On completing Masters in the M.Sc. in Computer Science, the students shall be able to realize the following outcomes:

| PSO | Description |
|---|---|
| PSO1 | Communicate computer science concepts, designs, and solutions effectively and professionally |
| PSO2 | Apply knowledge of computing to produce effective designs and solutions for specific problems |
| PSO3 | Use software development tools, software systems, and modern computing platforms |
| PSO4 | To have the knowledge and the ability to develop creative solutions |
| PSO5 | To develop skills to learn new technology |
| PSO6 | To develop critical reasoning |
| PSO7 | To apply computer science theory and software development concepts to construct computing-based solutions |
| PSO8 | To design and develop computer programs/computer-based systems in the area related to algorithms, networking, web design, cloud computing, Artificial Intelligence, Mobile applications |
| PSO9 | The ability to understand, analyse and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity |
| PSO10 | The ability to understand the evolutionary changes in computing, apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success, real-world problems, and meet the challenges of the future |
| PSO11 | The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, lifelong learning and a zest for higher studies and also to act as a good citizen by inculcating in them moral values & ethics |

## Postgraduate Attributes

# Masters in Computer Science (Semester System)
### Choice Based Credit System

- Disciplinary Knowledge
- Creative & Critical Thinking
- Reasoning and Analytical abilities
- Logic/Discrete Mathematics knowledge
- Logical Thinking
- Problem analysis and solving abilities
- Life Skills
- Moral & Ethical Values
- Research Skills

# Masters in Computer Science (Semester System)
### Choice Based Credit System

## Structure of Masters' Programme

**Scheme for**
**M.Sc. Computer Science (Semester I)**
**Examination 2021**
**Session 2021-22**

| | | Semester I | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Course Code** | **Course Title** | **Exam Hours** | **Max. Marks** | | **Min. Marks** | **L** | **T** | **P\*** | **Credits** |
| | | | | **Int. Marks** | **Ext. Marks** | | | | | |
| **Core Courses** | | | | | | | | | | |
| 1 | FS-COMP-MSC-CS-CC-101 | Mathematics for Computer Science | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 2 | FS-COMP-MSC-CS-CC-102 | Internet Programming | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 3 | FS-COMP-MSC-CS-CC-103 | Computer Organization | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 4 | FS-COMP-MSC-CS-CC-104 | C++ Programming | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| **Foundation Courses** | | | | | | | | | | |
| 5 | FS-COMP-MSC-CS-FC-105 | Computer Fundamentals | 3 | 50\* | - | 18 (36%) | 2 | 2 | 1 | 5 |
| | | **Total Marks** | | 40 | 160 | | | | | |
| | | **Total Theory Marks (A)** | | 200 | | **72** **(36% aggregate)** | **Total Credits** | | | **25** |
| **Practical courses** | | | | | | | | | | |
| 6 | FS-COMP-MSC-CS-CP-106 | Combined Practical | 3 | 25 | 75 | 36 (36% aggregate) | \*combined practical of above subjects | | | |
| | | **Total Practical Marks (B)** | | 100 | | | | | | |
| | | **Grand Total (A+B)** | | 300 | | | | | | |
| \*Audit course. The candidate will have to qualify the paper by the time he / she qualifies for the Programme. He/She can avail maximum 4 chances along with the Semester Examinations. | | | | | | | | | | |

**Scheme for**
**M.Sc. Computer Science (Semester II)**
**Examination 2022**
**Session 2021-22**

| | | Semester II | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Course Code** | **Course Title** | **Exam Hours** | **Max. Marks** | | **Min. Marks** | **L** | **T** | **P\*** | **Credits** |
| | | | | **Int. Marks** | **Ext. Marks** | | | | | |
| **Core Courses** | | | | | | | | | | |

# Masters in Computer Science (Semester System)
## Choice Based Credit System

| | Course Code | Course Title | Exam Hours | Int. Marks | Ext. Marks | Min. Marks | L | T | P* | Credits |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | FS-COMP-MSC-CS-CC-201 | Database Management System | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 2 | FS-COMP-MSC-CS-CC-202 | Data Communication and Networking | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 3 | FS-COMP-MSC-CS-CC-203 | Operating System | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 4 | FS-COMP-MSC-CS-CC-204 | Ethical Hacking | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| **Foundation Course** | | | | | | | | | | |
| 5 | FS-COMP-MSC-CS-FC-205 | Human and National Values | 3 | 50* | - | 18 (36%) | 2 | 2 | 1 | 5 |
| | | **Total Marks** | | 40 | 160 | | | | | |
| | | **Total Theory Marks (A)** | | 200 | | **72 (36% aggregate)** | **Total Credits** | | | **25** |
| **Practical Courses** | | | | | | | | | | |
| 6 | FS-COMP-MSC-CS-CP-206 | Combined Practical | 3 | 25 | 75 | 36 (36% aggregate) | *combined practical of above subjects | | | |
| | | **Total Practical Marks (B)** | 100 | | | | | | | |
| | | **Grand Total (A+B)** | 300 | | | | | | | |

*Audit course. The candidate will have to qualify the paper by the time he / she qualifies for the Programme. He/She can avail maximum 4 chances along with the Semester Examinations.

**Scheme for**
**M.Sc. Computer Science (Semester III)**
**Examination 2022**
**Session 2021-22**

| Semester III | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Course Code | Course Title | Exam Hours | Max. Marks | | Min. Marks | L | T | P* | Credits |
| | | | | Int. Marks | Ext. Marks | | | | | |
| **Core Courses** | | | | | | | | | | |
| 1 | FS-COMP-MSC-CS-CC-301 | Data Structures | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 2 | FS-COMP-MSC-CS-CC-302 | Java | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| **Core Elective Courses** | | | | | | | | | | |

# Masters in Computer Science (Semester System)
## Choice Based Credit System

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 | FS-COMP-MSC-CS-CE-303 | a) Software Engineering & Research Methodology<br>b) Artificial Intelligence<br>c) Python<br>d) Theory of Computation | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| **Elective Open Courses** | | | | | | | | | | |
| 4 | FS-COMP-MSC-CS-EO-304 | a) Data Analysis Using R<br>b) Introduction to LaTeX<br>c) Natural Language Processing<br>d) Introduction to Cyber Security | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| **Total Marks** | | | 40 | 160 | | | | | | |
| **Total Theory Marks (A)** | | | 200 | | **72**<br>**(36% aggregate)** | **Total Credits** | | | **25** | |
| **Practical Courses** | | | | | | | | | | |
| 5 | FS-COMP-MSC-CS-CP-305 | Combined Practical | 3 | 25 | 75 | 36 (36% aggregate) | *combined practical of above subjects | | | |
| **Total Practical Marks (B)** | | | 100 | | | | | | | |
| **Grand Total (A+B)** | | | 300 | | | | | | | |

## Scheme for
## M.Sc. Computer Science (Semester IV)
## Examination 2022
## Session 2021-22

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semester IV** | | | | | | | | | | |
| | **Course Code** | **Course Title** | **Exam Hours** | **Max. Marks** | | **Min. Marks** | **L** | **T** | **P*** | **Credits** |
| | | | | **Int. Marks** | **Ext. Marks** | | | | | |
| **Core Courses** | | | | | | | | | | |
| 1 | FS-COMP-MSC-CS-CC-401 | Computer Graphics & Multimedia | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 2 | FS-COMP-MSC-CS-CC-402 | Android Programming | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| **Core Elective Courses** | | | | | | | | | | |

| 3 | FS-COMP-MSC-CS-CE-403 | a) Cloud Computing<br>b) Internet of Things<br>c) Big Data & Data Mining<br>d) Machine Learning | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Elective Open Courses** | | | | | | | | | | |
| 4 | FS-COMP-MSC-CS-EO-404 * | a) Research Project<br>b) Review<br>c) Dissertation<br>d) Internship | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5** |
| | | **Total Marks** | | 40 | 160 | | | | | |
| | | **Total Theory Marks (A)** | | 200 | | **72** (36% aggregate) | **Total Credits** | | | **25** |
| **Practical Courses** | | | | | | | | | | |
| 5 | FS-COMP-MSC-CS-CP-405 | Combined Practical | 3 | 25 | 75 | 36 (36% aggregate) | *combined practical of above subjects | | | |
| | | **Total Practical Marks (B)** | 100 | | | | | | | |
| | | **Grand Total (A+B)** | 300 | | | | | | | |

*10 min presentation/viva voce of each student

** Teacher guide shall decide the hrs required for carrying out the decided Research Project/ Review/Case Study by the allotted student(s) in the forms of lecture, tutorial and lab work as per the requirement of the study topic.

## Learning Outcome Index

Learning Outcomes are statements of knowledge, skills, and abilities a student should possess and demonstrate upon completion of learning experiences.

I. **Programme Outcomes(PO) and Programme Specific Outcomes (PSO)**

| | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 | PSO10 | PSO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PO1 | x | x | x | x | x | x | x | x | | x | x |
| PO2 | x | | x | | x | x | x | x | x | x | x |
| PO3 | x | x | x | | x | x | x | x | x | x | x |
| PO4 | x | x | x | x | x | x | | x | x | x | x |
| PO5 | x | x | x | x | x | x | x | x | x | x | x |
| PO6 | x | x | x | x | x | x | x | | | x | x |
| PO7 | | | | x | x | | | x | | x | x | x |
| PO8 | | x | | x | | | x | x | x | | | x |
| PO9 | x | x | | x | x | | | x | x | | | x |
| PO10 | x | x | x | | x | | | | | x | | x |
| PO11 | x | x | x | | x | | x | x | x | x | x | x |

II. **Programme Specific Outcomes (PSO) and Core Courses (CC)**

| | MCS 101 | MCS 102 | MCS 103 | MCS 104 | MCS 201 | MCS 202 | MCS 203 | MCS 204 | MCS 301 | MCS 302 | MCS 401 | MCS 402 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSO1 | x | x | x | x | x | x | x | x | x | x | x | x |
| PSO2 | x | x | x | x | x | x | x | x | x | x | x | x |
| PSO3 | | x | | x | x | | | x | x | x | | x |
| PSO4 | x | x | x | x | x | x | x | x | x | x | x | x |
| PSO5 | x | x | x | x | x | x | x | x | x | x | x | x |
| PSO6 | x | | x | | x | x | x | | | | x | |
| PSO7 | x | x | x | x | x | x | x | x | x | x | x | x |
| PSO8 | | x | | x | x | | | x | x | x | | x |
| PSO9 | | x | x | x | x | | | x | x | x | x | x |
| PSO10 | x | x | x | x | x | x | x | x | x | x | x | x |
| PSO11 | x | x | x | x | x | x | x | x | x | x | x | x |

# Masters in Computer Science (Semester System)
## Choice Based Credit System

**II. Programme Specific Outcomes (PSO) and Core Elective Courses (CEC)**

|         | MCS 303a | MCS 303b | MCS 303c | MCS 303d | MCS 403a | MCS 403b | MCS 403c | MCS 403d |
|---------|----------|----------|----------|----------|----------|----------|----------|----------|
| PSO1    | x        | x        | x        | x        | x        | x        | x        | x        |
| PSO2    | x        | x        | x        | x        | x        | x        | x        | x        |
| PSO3    | x        |          | x        |          | x        |          | x        |          |
| PSO4    | x        | x        | x        | x        | x        | x        | x        | x        |
| PSO5    | x        | x        | x        | x        | x        | x        | x        | x        |
| PSO6    |          | x        |          | x        |          | x        |          | x        |
| PSO7    | x        | x        | x        | x        | x        | x        | x        | x        |
| PSO8    | x        |          | x        |          | x        |          | x        |          |
| PSO9    | x        | x        | x        | x        | x        | x        | x        | x        |
| PSO 10  | x        | x        | x        | x        | x        | x        | x        | x        |
| PSO 11  | x        | x        | x        | x        | x        | x        | x        | x        |

**IV. Programme Specific Outcomes (PSO) and Open Elective Courses (OEC)**

|         | MCS 305a | MCS 305b | MCS 405a | MCS 405b |
|---------|----------|----------|----------|----------|
| PSO1    | x        | x        | x        | x        |
| PSO2    | x        | x        | x        | x        |
| PSO3    | x        |          | x        |          |
| PSO4    | x        | x        | x        | x        |
| PSO5    | x        | x        | x        | x        |
| PSO6    |          | x        |          | x        |
| PSO7    | x        | x        | x        | x        |
| PSO8    | x        |          | x        |          |
| PSO9    | x        | x        | x        | x        |
| PSO 10  | x        | x        | x        | x        |
| PSO 11  | x        | x        | x        | x        |

## Objectives, Course-level Learning Outcomes, Contents, and Suggested Readings
### Semester I

**Paper Code:FS-COMP-MSC-CS-CC-101**
**Paper Name: Mathematics for Computer Science**

**Course Objectives:**
CO1. To learn to evaluate mathematical arguments revolving around computation
CO2. To understand the basics of Combinations and Permutations
CO3. To acquire the ability to represent relations matrices and digraphs
CO4. To acquire and apply the knowledge on Graphs and Trees to real-world applications
CO5. To have the ability to Demonstrate the working of Grammars and Languages

**Learning Outcomes:**
After completion of this course, the student will be able to-
LO1. Comprehend and evaluate mathematical arguments revolving around computation.
LO2. Understand the basics of Combinations and Permutations.
LO3. Represent relations matrices and digraphs.
LO4. Apply the knowledge on Graphs and Trees to real-world applications.
LO5. Demonstrate the working of Grammars and Languages.
**Note:** Non-Scientific Calculator may be allowed in the end-semester examination.
**Course Description**

### Unit – I

**Sets**: different types of sets, set operations; Basic Counting Principles, Pigeonhole Principle, Binomial Coefficients, Binomial Theorem, Permutations, Combinations; Matrices: addition, multiplication; Vectors: position vector, addition, subtraction and products of vectors.

## Unit - II

Mathematical Induction; **Logic**: Propositions and logical operations, Conditional statements, Tautologies and Contradictions, Logical Equivalence, quantifiers. Basic computability theory: Chomsky Hierarchy, the concept of models of computation, the concept of types of languages and grammars.

## Unit - III

**Relations**: Representation of Relations, Properties of relations, transitive closure; Ordered Sets: poset, Properties, Hasse Diagram, Extremal elements of posets; **Functions**: Types of Functions, Asymptotic notations; Coordinate Systems: representation of points, straight lines, standard equation of circles.

## Recommended Readings

1. K.H. Rosen, Discrete Mathematics and its applications, seventh edition
2. Kolman, Busby and Ross, Discrete Mathematical Structures, Sixth Edition, PHI.

## Suggested Readings

3. Schaum's Outline Of Theory and Problems of DiscreteMathematics, Third Edition.
4. C L Liu, Elements of Discrete Mathematics, TMH,
5. John Vince, Foundation Mathematics for Computer Science: A Visual Approach, Springer
6. George B. Thomas and Ross L. Finney, Calculus and Analytic Geometry, Addison Wesley
7. J. Ullman and J. Hopcroft , Introduction to Automata Theory, Languages, and Computation, Pearson Education
8. Daniel I.A. Cohen, Introduction to Computer Theory, 2ed, Wiley.
9. Peter Linz, An Introduction to Formal Languages and Automata, Sixth edition.

**Paper Code:FS-COMP-MSC-CS-CC-102**
**Paper Name: Internet Programming**

## Course Objectives -

 CO1. To gain knowledge of how the client-server model of Internet programming works
 CO2. To learn design and development of  interactive, client-side, executable web applications
 CO3.To acquire the ability to demonstrate how Internet programming tasks are accomplished
 CO3: To know how to build tools that assist in automating data transfer over the Internet.
 CO4: To understand the advantages and disadvantages of the core Internet protocols

## Learning Outcomes:

After completion of this course, the student will be able to-
LO1: Explain how the client-server model of Internet programming works
LO2: Design and develop interactive, client-side, executable web applications
LO3: Demonstrate how Internet programming tasks are accomplished
LO3: Build tools that assist in automating data transfer over the Internet
LO4: Compare the advantages and disadvantages of the core Internet protocols

## Course Description

### Unit I

Internet Basics: Evolution of the Internet, Basic internet terms and applications. ISP, Anatomy of an e-mail Message, basics of sending and receiving, E-mail Protocol; Mailing List- Subscribing, Unsubscribing. Introduction to World Wide Web and its work, Web Browsers, Search Engine, Downloading, HyperText Transfer Protocol (HTTP), URL, Web Servers, FTP, Web publishing- Domain Name Registration, Space on Host Server for Web Site, Maintain and Updating.

### Unit -  II

HTML: Elements of HTML & Syntax, Comments, Headings,  Paragraph, Span, Pre Tags, Backgrounds, Formatting tags, Images, Hyperlinks, div tag, List Type and its Tags, Table Layout, Use of Forms in Web Pages.  CSS**:** Introduction to Cascading Style Sheets, Types of Style Sheets (Inline, Internal and External), using Id and classes, CSS properties: Background Properties, Box Model Properties, Margin, Padding, List Properties, Border Properties, Positioning Properties.

### Unit - III

Java Script: Introduction to Client-Side Scripting, Introduction to JavaScript, Comments, Variables in JS, Global Variables, Data types, Operators in JS, Conditions Statements (If, If Else, Switch), JavaScript Loops (For Loop, While Loop, Do While Loop), JS Popup Boxes (Alert, Prompt, Confirm), JS Events, Onload, Onunload, Onsubmit, OnFocus, Onchange Event, Onblur Event, Onmouseover, Onclick, Ondbclick Events, JS Arrays, Working with Arrays, JS Objects, Window object, Document object, JS Functions, getElementById, innerHTML property, inner Text property, form validation, email validation.

# Masters in Computer Science (Semester System)
## Choice Based Credit System

**Recommended Readings**

1. Thomas A. Powell, HTML: The Complete Reference, Osborne/McGraw-Hill
2. Deitel, Deitel and Nieto, Internet & WWW. How to program, 2<sup>nd</sup> Edition, Pearson Education Asia.

**Suggested Readings**

3. E Stephen Mack, Janan Platt, HTML 4.0, No Experience Required, 1998, BPB Publications.
4. Sybex, HTML Complete, BPB Publications.
5. V.K Jain, Internet and Web Page Designing, BPB Publications.
6. Ivan Bayross, Web Enabled Commercial Application Development Using HTML, DHTML, java script, Perl CGI, BPB publications.

**Paper Code:FS-COMP-MSC-CS-CC-103**
**Paper Name: Computer Organization**

**Course Objectives:**

CO1: To understand the structure, function, and characteristics of computer systems.
CO2: To understand the design of the various functional units and components of computers.
CO3: To Identify the elements of modern instruction sets and their impact on processor design.
CO4: To acquire the ability to explain the function of each element of a memory hierarchy,
CO5: To identify and compare different methods for computer I/O

**Learning Outcomes:**

After completion of this course, the student will be able to-
LO1: Understand the structure, function, and characteristics of computer systems.
LO2: Understand the design of the various functional units and components of computers.
LO3: Identify the elements of modern instruction sets and their impact on processor design.
LO4: Explain the function of each element of a memory hierarchy,
LO5: Identify and compare different methods for computer I/O.

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## Unit I

**Components of a Computer:** Processor, Memory, Input-Output Unit, Difference between Organization and Architecture, Hardware-Software Interaction. **Number System:** Concept of Bit and Byte, types, and conversion. **Complements:** 1's complement, 2's complement. **Binary Arithmetic:** Addition, overflow, subtraction, multiplication (booth's algorithm), and division algorithm. **Logic gates:** Boolean Algebra, Map Simplification.

## Unit II

**Combinational circuits**: Half Adder, Full Adder, Decoders, Multiplexers. **Sequential circuits:** Flip Flops- SR, JK, D, T Flip-Flop, Excitation Tables, State Diagram, State Table, Registers, Counters.
**Input-Output Organization:** Peripheral devices, I/O Interface, Asynchronous Data Transfer, Modes of Data Transfer, Priority Interrupt, Direct Memory Access, I/O Processor.
**Memory Organization:** Types and capacity of Memory, Memory Hierarchy, Associative Memory, Buffer, Cache Memory, Virtual Memory.

## Unit III

**Intel 8085 Microprocessor:** Introduction, ALU, Timing and Control Unit, Register Set, Data and Address Bus, Addressing modes, Complete Intel 8085 Instruction set, Instruction format, Opcode and Operand, Word Size, Instruction Cycle, Pin Configuration, Intel 8085 programs.

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**Recommended Readings**

1. M. Morris Mano, Computer System Architecture, Pearson, Prentice Hall.
2. J.P. Hayes, Computer Architecture & Organization, Tata McGraw Hill

**Suggested Readings**

3. Malvino Leach and Jerald A. Brown, Digital Computer Electronics, McGraw Hill.
4. Ramesh Gaonkar, Microprocessor Architecture, Programming, and Application With the 8085, PENRAM.
5. B.Ram, Fundamentals of Microprocessor and Microcomputers, Danpat Rai Publications.

**Paper Code:FS-COMP-MSC-CS-CC-104**
**Paper Name : C++ Programming**

**Course Objectives:**

CO1. To declare, initialize and process variables, constants, and arrays
CO2. To read and print values from the keyboard using Scanner and Dialog boxes
CO3. To create statements for decisions and loops
CO4. To define functions and return values

CO5. To create classes, objects, and constructors
CO6. To understand and apply OO design concepts
CO7. To create, open, manipulate and close files using Streams
CO8. To create applets for drawing shapes and playing audio clips
**Learning Outcomes:**
After completion of this course, the student will be able to-
LO1. Declare, initialize and process variables, constants, and arrays
LO2. Read and print values from the keyboard using Scanner and Dialog boxes
LO3. Create statements for decisions and loops
LO4. Define functions and return values.
LO5. Create classes, objects, and constructors.
LO6. Understand and apply OO design concepts.
LO7. Create, open, manipulate and close files using Streams.
LO8. Create applets for drawing shapes and playing audio clips.

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### Unit I
**Object-Oriented System** Object-Oriented Paradigm: need, characteristics, applications. Basics of C++, branching, looping, and jump statements. **Functions**: need, types, passing arguments by value and reference, recursive function, pointers, and functions. **Arrays**: need, types, array and function, array and pointers.

### Unit II
**Class**: Basics, static data members, Inline Function, Constructors and Destructors: need, types, usage, **Inheritance** - need, usage, types, compile-time and run-time polymorphism, overloading and overriding, virtual function, friend function, abstract class. **Operator overloading**: need, rules, through member function and through friend function.

### Unit III
String handling, String class, Templates, Additional Features for C++ 11, C++14 and C++17 Searching and Sorting: **Searching**: Linear Search, Binary Search. **Sorting:** Insertion Sort, Selection Sort, Quick Sort, Bubble Sort, Heap Sort, Shell Sort, Merge sort, Radix Sort, Counting Sort, Bucket Sort.

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### Recommended Readings
1. E. Balagurusamy, Object-Oriented Programming With C++ , Tata Mcgraw Hill.
2. Herbert Schildt, C++ The Complete Reference, Tata Mcgraw Hill.
### Suggested Readings
3. Schaum Series, Object Oriented Programming With C++, Tata Mcgraw Hill.
4. Paul J. Deitel and Harvey M. Deitel, C++11 for Programmers (Deitel Developer), Prentice Hall; 2nd edition.
5. Marc Gregoire, Nicholas A. Solter and Scott J.Kleper, Professional C++, Goodreads Publications.
6. Bjarne Stroustrup, A Tour of C++.
7. Bartłomiej Filipek, C++17 in Detail.

**Paper Code:FS-COMP-MSC-CS-FC-106**
**Paper Name: Computer Fundamentals**

**Course Objectives:**
CO1. To understand the  characteristics of computers
CO2. To know about the generations of computers
CO3. To have knowledge about computer languages
CO4. To understand the basics of an operating system
CO5. To be acquaint with word processor, spreadsheet, and presentation
CO6. To understand and apply the concept of algorithms and algorithm analysis
CO7. To know about some unsolved problems of computer science
**Learning Outcomes:**
After completion of this course, the student will be able to-
LO1. Understanding of  the  characteristics of computers
LO2. Know about the generations of computers
LO3. Having knowledge of computer languages
LO4. Understanding of the basics of operating system
LO5. Acquaintance with word processor, spreadsheet, and presentation
LO6. Understanding and ability to design algorithms
LO7. Know about some unsolved problems of computer science

# Masters in Computer Science (Semester System)
## Choice Based Credit System

### Unit I
Basics: Block Diagram, characteristics, generations of computers, classification of computers; Binary number system, Limitations of Computers, Primary and secondary memory, Input and output devices; Computer languages: Machine language, assembly language, higher-level language, 4GL. Introduction to Compiler, Interpreter, Assembler, System Softwares, Application Softwares.Operating System: Features of Windows, Linux, Macintosh, Android. Open-source software: concept and examples.

### Unit II
Word Processing software: different formats for saving a word document, creating, editing documents and related operations, formatting features and related operations, spelling and grammar checker, headers and footers, creating and managing tables; printing, macros, mail merge, equation editor. Spreadsheet Software: Workbook, worksheets, data types, operators, cell formats, freeze panes, editing features, formatting features, creating formulas, using formulas, cell references.

### Unit III
Presentation Graphics Software: Templates, views, formatting slides, slides with graphs, animation, using special features, presenting slide shows. Computer Problem Solving: Algorithms, Efficiency, and analysis of algorithms Writing algorithms for simple problems like factorial computation, generation of the Fibonacci sequence, and checking for prime number; Examples of unsolved problems in Computer Science.

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### Recommended Readings
1. P.K Sinha, Computer Fundamentals, BPB Publications.
2. Rajaraman, Fundamentals of Computers, Fourth Edition, Prentice-Hall India Pvt. Limited.

### Suggested Readings
3. Peter Norton, Introduction to Computers, 4th Edition, TMH Ltd, New Delhi.
4. R.G. Dromey, How to solve it by Computers, Pearson Publishers, New Delhi.
5. Dorothy House, Microsoft Word, Excel, and PowerPoint: Just for Beginners.

**Web resources:**
1. https://documentation.libreoffice.org/en/english-documentation/getting-started-guide/
2. https://www.coursera.org/learn/creative-problem-solving
3. http://web.mit.edu/rsi/www/pdfs/new-latex.pdf
4. https://www.latex-project.org/help/books/
5. https://support.google.com/docs/?hl=en#topic=1382883
6. https://en.wikipedia.org/wiki/List_of_unsolved_problems_in_computer_science
7. https://www.claymath.org/millennium-problems

### Semester II

**Paper Code:FS-COMP-MSC-CS-CC-201**
**Paper Name: Database Management System**

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**Course Objectives:**
CO1: To understand the need for a DB approach and understand the components and roles of DBMS
CO2: To know how to write SQL queries for the given problem statement
CO3: To apply DB system development life cycle to business problems
CO4. To develop ER diagram for representing the conceptual data model
CO5: To convert ER diagram into a set of relations representing the logical data model
CO6: To implement a collection of ties in the chosen DBMS product, such as ORACLE
CO7: To have a broad understanding of database concepts and database management system software
CO8: To have a high-level experience of major DBMS components and their function
CO9: To be able to model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model.
CO10: To be able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
CO11: To understand detailed architecture, define objects, load data, query data, and performance tune SQL databases.
CO12: To be able to handle large volumes of structured, semi-structured, and unstructured data using database technologies.

**Learning Outcomes:**
After completion of this course, the student will be able to-
LO1: Appreciate the need for a DB approach and understand the components and roles of DBMS
LO2: Write SQL queries for the given problem statement
LO3: Apply DB system development life cycle to business problems
LO4. Develop ER diagram for representing the conceptual data model

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LO5: Convert ER diagram into a set of relations representing the logical data model

LO6: Implement a collection of ties in the chosen DBMS product, such as ORACLE

LO7: Have a broad understanding of database concepts and database management system software

LO8: have a high-level experience of major DBMS components and their function

LO9: be able to model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model.

LO10: be able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.

LO11: To understand detailed architecture, define objects, load data, query data, and performance tune SQL databases.

LO12: Able to handle large volumes of structured, semi-structured, and unstructured data using database technologies.

## Unit I

**Introduction**: Characteristics of database approach, Advantages, Database system architecture, Overview of different types of Data Models and data independence, Schemas and instances, Database languages and interfaces; **E-R Model**: Entities, Attributes, keys, Relationships, Roles, Dependencies, E-R Diagram; Normalization: Definition, Functional dependencies and inference rules, 1NF, 2NF, 3NF, and BCNF.

## Unit II

**Introduction to Relational model**, Constraints: Domain, Key, Entity integrity, Referential integrity; Keys: Primary, Super, Candidate, Foreign; **Relational algebra**: select, project, union, intersection, minus, cross product, different types of join, division operations; aggregate functions and grouping**; SQL**: Data Types, statements: select, insert, update, delete, create, alter, drop; views, SQL algebraic operations, nested queries; Stored procedures: Advantages, Variables, creating and calling procedures, if and case statements, loops, Cursors, Functions, Triggers.

## Unit III

**Transactions processing**: Definition, desirable properties of transactions, serial and non-serial schedules, the concept of serializability, conflict-serializable schedules; **Concurrency Control:** Two-phase locking techniques, dealing with Deadlock and starvation, deadlock prevention protocols, basic timestamp ordering algorithm; Overview of database recovery techniques; the concept of data warehousing.

### Recommended Readings
1. Ramez A. Elmasri, Shamkant Navathe, Fundamentals of Database Systems, 5th Ed, Pearson Publications.
2. Korth, Silberschatz, Sudarshan, Database System Concepts, Mcgraw Hill.

### Suggested Readings
3. Bipin C. Desai, An Introduction to Database Systems, Galgotia Publication.
4. Ivan Bayross, SQL, PL/SQL Programming, BPB publications.
5. Ivan Bayross, Commercial Application Development Using Oracle Developer 2000, BPB publications.

### Web Resources
1. http://www.mysqltutorial.org/mysql-stored-procedure-tutorial.aspx

**Paper Code:FS-COMP-MSC-CS-CC-202**
**Paper Name: Data Communication and Networking**

**Course**            **Objectives:**

After completion of this course the student will be able to-

CO1. To gain the ability to create a new protocol and test its efficiency

CO2. To design a new network architecture using protocols and interfaces

CO3. To create a hybrid topology using the existing topologies, and check inefficiency

CO4. To apply different encoding and decoding mechanisms involved in various types of transmission media and measure the transmission impairments

CO5. To design a model internet with various categories of networks and test the transmission rate

CO6. To understand the basics of data communication, networking, the internet, and their importance

CO7. To analyze the services and features of various protocol layers in data networks

CO8. To differentiate wired and wireless computer networks

CO9. To analyze TCP/IP and their protocols

CO10. To recognize the different internet devices and their functions

CO11. To identify the primary security threats of a network

**Learning Outcomes:**

After completion of this course the student will be able to-

LO1. Create a new protocol and test its efficiency.

LO2. Design a new network architecture using protocols and interfaces.

LO3. Create a hybrid topology using the existing topologies, and check inefficiency.
LO4. Apply different encoding and decoding mechanisms involved in various types of transmission media and measure the transmission impairments.
LO5. Design a model internet with various categories of networks and test the transmission rate.
LO6. Understand the basics of data communication, networking, the internet, and their importance.
LO7. Analyze the services and features of various protocol layers in data networks.
LO8. Differentiate wired and wireless computer networks.
LO9. Analyze TCP/IP and their protocols.
LO10. Recognize the different internet devices and their functions.
LO11. Identify the primary security threats of a network.

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### Unit - I
**Data Communication and Networking:** Overview, Network Types, LAN Technologies, Topologies, Models- OSI Model, TCP/IP Stack, Security
**Physical Layer:** Introduction, Impairments, Performance, Digital Transmission, modes, digital to digital, analog to digital, Analog Transmission, digital to analog, analog to analog, Transmission media, Wireless Transmission, Multiplexing, FDM, TDM, CDM, WDM, **Switching techniques:** Circuit Switching, Packet switching, Datagram, Virtual circuit, and Permanent Virtual Circuit, Connectionless and connection-oriented communication, Message switching,

### Unit - II
**Data Link Layer:** Introduction, Error Detection, and Correction, Data Link Control: Line Discipline- Enq/Ack, Poll/Select, **Flow Control**: Stop And Wait, Sliding Window, **Error Control:** ARQ, Stop and Wait ARQ, Sliding Window ARQ.
**Network Layer:** Introduction, Network Addressing, Routing, Internetworking, Tunneling, Packet Fragmentation, Network Layer Protocols, ARP, ICMP, IPv4, IPv6
**Transport Layer:** Introduction, Function, End to end communication, Transmission Control Protocol, User Datagram Protocol
**Application Layer:** Introduction, Client-Server Model, Application Protocols, Network Services

### Unit - III
**Cyber Security:** definition, cybercrime and information security, cybercriminals, classification of cybercrime. Cyber offenses: categories of cybercrime.
**Tools and methods used in cybercrime:** phishing, types of phishing, types, and techniques of ID theft, password cracking, keyloggers and spyware, backdoors, steganography, DoS, SQL Injection.
**Cybercrime on mobile and wireless devices**: attacks on wireless networks, Authentication security service, attacks on mobile phones. Cyber Law, The Indian IT Act, Digital Signatures, Anti- Cybercrime Strategies, Cyberterrorism, Indian ITA 2000.

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### Recommended Readings
1. Nina Godbole & Sunit Belapur, Cyber Security.
2. Forozan, Data Communication and Networking, Tata McGraw Hill.

### Suggested Readings
3. Dr. Madhulika Jain, Satish Jain, Data Communication And Computer Networks, BPB publications.
4. William Stallings, Data and Computer Communications, Pearson Education.
5. A. S. Tanenbaum, Computer Networks, Fourth Edition, Pearson Education.

==Paper Code:FS-COMP-MSC-CS-CC-203==
==Paper Name: Operating System==

**Course Objectives:**
CO1. To be able to design and understand the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory, and Paging systems.
CO2. To be able to evaluate, and compare OS components through instrumentation for performance analysis.
CO3. To analyze the various device and resource management techniques for time-sharing and distributed systems
CO4. To develop and analyze simple concurrent programs using transactional memory and message passing, and understand the trade-offs and implementation decisions
**Learning Outcome:**
After completion of this course, the student will be able to-
LO1. Allocate Main Memory based on various memory management techniques
LO2. Compare Memory allocation using Best fit, Worst fit, and first hold policies
LO3. Apply page replacement policies for dynamic memory management
LO4. Schedule CPU time using scheduling algorithm for processors

LO5. Compare various device scheduling algorithms. serve

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### Unit I

Introduction to Operating System, layered Structure, Functions, Types; Process: Concept, Process States, PCB; Threads, System calls; Process Scheduling: types of schedulers, context switch, CPU Scheduling, Preemptive Scheduling, Scheduling Criteria- CPU Utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling Algorithms- FCFS, SJF, Priority Scheduling, Round Robin Scheduling, MLQ Scheduling, MLQ With Feedback.

### Unit II

Synchronization: Critical Section Problem, Requirements for a solution to the critical section problem; Semaphores, simple solution to Readers-Writers Problem. Deadlock: Characterization, Prevention, Avoidance, Banker's Algorithm, Recovery from Deadlock. Memory Management: Physical and virtual address space, Paging, Overview of Segmentation; Virtual Memory Management: Concept, Page Replacement techniques- FIFO, LRU, Optimal

### Unit III

Linux: features of Linux, steps of Installation, Shell and kernel, Directory structure, Users and groups, file permissions, commands- ls, cat, cd, pwd, chmod, mkdir, rm, rmdir, mv, cp, man, apt, cal, uname, history etc.; Installing packages; Shell scripts: writing and executing a shell script, shell variables, read and expr, decision making (if-else, case), for and while loops.

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### Recommended Readings

1. Abraham Silberschatz, Peter Baer Galvin, Operating System Principles, John Wiley And Sons Inc.
2. Milan Milen Kovic, Operating System Concepts And Design, Tata Mcgraw Hill.

### Suggested Readings

3. Andrew S. Tanenbaum, Herbert Bos, Modern Operating System.
4. Mike McGrath, Linux in easy steps.
5. Sumitabha Das, Unix concepts and applications, TMH.

**Paper Code:FS-COMP-MSC-CS-CC-204**
**Paper Name: Ethical Hacking**

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**Course Objectives:**
CO1. To understand the concept of ethical hacking
CO2. To have knowledge to installation and functioning of kali linux
CO3. To have knowledge about various malwares
CO4. To understand the basics of metasploit
CO5. To be acquaint with working and network analysis with Wireshark
CO6. To understand the concept of DDoS attacks
CO7. To know about hardware hacking, hijack sessions, hacking web servers, website Hacking , SQL Injection and SQLMAP
CO8. To have basic knowledge of router attacks, wi-fi attacks, password attacks and phishing attacks.
Learning Outcomes:
After completion of this course the student will be able to-
LO1. Understanding of the concept of ethical hacking
LO2. Know about the installation and functioning of kali linux
LO3. Having knowledge of about various malwaress
LO4. Understanding of the basics of metasploit
LO5. Acquaintance with with working and network analysis with Wireshark
LO6. Understanding of the concepts of DDoS attacks
LO7. Know about hardware hacking, hijack sessions, hacking web servers, website Hacking , SQL Injection and SQLMAP
LO8. Have basic knowledge of router attacks, wi-fi attacks, password attacks and phishing attacks.

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### UnitI

Introducing Hacking, Different types of hacking, Phases of hacking, Installation and configuration of Kali Linux, Overview of directory structure, Usage of basic commands; Malwares – Virus , Worms, Trojan; Information gathering using NMAP and ZenMAP .

### Unit II

Metasploit: Exploiting System Software and Privilege, Metasploit Social Engineering Attack. Working and Network analysis with Wireshark , Network and web scanning about target , Packet captures and man-in-the-Middle attacks. Hacking using different social Engineering techniques.

**Unit III**

DoS and DDoS attacks, Hardware hacking, Hijack sessions, Hacking web servers, Website Hacking , SQL Injection and SQLMAP, Database assessment , Router and Wi-Fi attacks, different types of password attacks, phishing attacks.

**Recommended Readings**

1. Daniel Dieterle, Basic Security Testing with Kali Linux, freely available online.
2.  Branko Spasojevic, Gray Hat Hacking The Ethical Hacker's Handbook, TMH.

**Suggested Readings**

3. Rafay Baloch, Ethical Hacking and Penetration Testing Guide, Auerbach Publications.
4.  Raphaël Hertzog, JimO'Gorman, and Mati Aharoni, Kali Linux Revealed, offsec press, https://kali.training/downloads/Kali-Linux-Revealed-1st-edition.pdf
5. Himanshu Sharma, Kali Linux - An Ethical Hacker's Cookbook, Packt Publishing Limited.

**Web resources:**

1.   https://nptel.ac.in/courses/106/105/106105217/

**Semester III**

**Paper Code:FS-COMP-MSC-CS-CC-301**
**Paper Name: Data Structures**

**Course Objectives:**

CO1. To Create and initialize variables, constants, arrays, pointers, structures, and unions.
CO2. To Manipulate values of variables, arrays, pointers, structures, unions, and files.
CO3. To create a function that can receive variables, arrays, pointers, and structures.
CO4. To define functions that can receive variables, arrays, pointers, and structures.
CO5. To create open, read, manipulate, write and close files.
CO6. To select and use appropriate data structures for the given problems.
CO7. To design efficient algorithms using various algorithm designing strategies
CO8. To analyze the problem and develop the algorithms related to these problems
CO9. To classify the problem and apply the appropriate design strategy to develop an algorithm
CO10. To design algorithm in the context of space and time complexity and apply the asymptotic notation
CO11. To be able to analyze algorithms and algorithm correctness.
CO12. To be able to summarize searching and sorting techniques
CO13. To be able to describe stack, queue, and linked list operations.
CO14. To be able to know. tree and graphs concepts

**Learning Outcomes:**

After completing this course, students will be able to:
LO1. Create and initialize variables, constants, arrays, pointers, structures, and unions.
LO2. Manipulate values of variables, arrays, pointers, structures, unions, and files.
LO3. Create a function that can receive variables, arrays, pointers, and structures.
LO4. Define functions that can receive variables, arrays, pointers, and structures.
LO5. Create open, read, manipulate, write and close files.
LO6. Select and use appropriate data structures for the given problems.
LO7. Design efficient algorithms using various algorithm designing strategies
LO8. Analyze the problem and develop the algorithms related to these problems
LO9. Classify the problem and apply the appropriate design strategy to develop an algorithm
LO10. Design algorithm in the context of space and time complexity and apply the asymptotic notation
LO11. Ability to analyze algorithms and algorithm correctness.
LO12. Ability to summarize searching and sorting techniques
LO13. Ability to describe stack, queue, and linked list operations.
LO14. Ability to know. tree and graphs concepts

**Unit I**

**Algorithm:** Efficiency & Analysis Algorithm: Time and Space complexity of Algorithm. **Abstract Data Type: Linked List-** Linear, Circular, Two Way List, Basic Operation on Linked Lists, Application of Linked List.

### Unit II

**Stack:** primitive operations, stack Application- Infix, postfix, prefix and Recursion Array, and Linked Representation of Stack. **Queue:** Primitive operation, Circular Queue, Priority Queue, D-queue, Array, and Linked Representation of Queue.

### Unit III

**Trees:** Basic terminology, **Binary Tree**: Representation as Array and link List, Basic operation, **Tree Traversal**: Inorder, Preorder, Postorder, Application of Binary Tree. B-tree, Height Balance Tree (AVL Tree) **Graph:** Basic Terminology, Directed, Undirected, Weighted, Representation of Graphs, **Graph Traversal**: Depth First Traversal, Breadth-First Search.

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### Recommended Readings

1. R.B Patel, Expert Data Structure with 'C', Khana Book Publishing.
2. Lipschutz, Data structure, Tata McGraw Hill.

### Suggested Readings

3. Yashvant Kanitkar, Data Structure, BPB publications.
4. Jean-Paul Tremblay, Paul G.Sarerson, An Introduction to Data Structures with Applications, Tata McGraw Hill.
5. Yedidyah Langsam, Moshe J.Augenstein, Arora M. Tenenbaum, Data Structure Using C and C++, Prentice- Hall India

**Paper Code:FS-COMP-MSC-CS-CC-302**
**Paper Name: Java**

**Course Objectives:**

CO1. To use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
CO2. To read and make elementary modifications to Java programs that solve real-world problems.
CO3. To validate input in a Java program.
CO4. To identify and fix defects and common security issues in code.
CO5. To document a Java program using Javadoc.
CO6. To use a version control system to track source code in a project.

**Learning Outcomes:**

After completing this course, students will be able to:

LO1. Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
LO2. Read and make elementary modifications to Java programs that solve real-world problems.
LO3. Validate input in a Java program.
LO4. Identify and fix defects and common security issues in code.
LO5. Document a Java program using Javadoc.
LO6. Use a version control system to track source code in a project.

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### Unit I

**Introduction to Java:** evolution, features, comparison with C and C++; Java program structure; tokens, keywords, constants, variables, data types, typecasting, statements, Operators and Expression; Conditional Statements and Loop Statements. **Class:** syntax, instance variable, class variables, methods, constructors, overloading.

### Unit II

**Inheritance:** types of inheritance, use of super, method overriding, final class, abstract class, wrapper classes. Arrays, Strings and Vectors, Packages and Interfaces, visibility controls

### Unit III

**Errors and Exceptions:** Types of errors, Exception classes, Exception handling in java, use of try, catch, finally, throw and throws. Taking user input, Command line arguments. **Multithreaded Programming:** Creating Threads, the Life cycle of thread, Thread priority, Thread synchronization, Inter-thread communication, Implementing the Runnable Interface.

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### Recommended Readings

1. Herbert Schildt, The Complete reference Java Ninth Edition, Tata McGraw Hill
2. Burd, Beginning Programming with Java For Dummies , For Dummies; 3 edition

### Suggested Readings

3. Herbert Schildt, Java: A Beginner's Guide, Sixth Edition: A Beginner's Guide, McGraw-Hill
4. E. Balagurusamy, Osborne MediaProgramming in JAVA, TMH.

5. Steven Holzner et al. JAVA 2 programming Black Book, Dreamtech Press.
6. E. Balagurusamy, Programming in JAVA, TMH.

**Paper Code:FS-COMP-MSC-CS-CE-303(a)**
**Paper Name: Software Engineering & Research Methodology**

## Course Objectives:

CO1. To learn the phases of software development
CO2. To develop process models and process systems multiple collections, models
CO3. To gather, understand, analyze and specify requirements
CO4. To develop architectural diagram, and implement by following coding principles
CO5. To apply testing strategies and handle software product maintenance issues
CO6. To get a good knowledge of the issues and challenges faced while doing the Software project Management.
CO7. To understand why the majority of the software projects fail and how that failure probability can be reduced effectively.
CO8. To do the Project Scheduling, tracking, Risk analysis, Quality management, and Project Cost estimation using different techniques.
CO9. To identify and discuss the role and importance of research in the social sciences.
CO10. To identify and discuss the issues and concepts salient to the research process.
CO11. To identify and discuss the complex issues inherent in selecting a research problem, selecting an appropriate research design, and implementing a research project.
CO12. To identify and discuss the concepts and procedures of sampling, data collection, analysis, and reporting.

## Learning Outcomes:

After completing this course, students will be able to:
LO1. Learn the phases of software development
LO2. Develop process models and process systems multiple collections, models
LO3. Gather, understand, analyze and specify requirements
LO4. Develop architectural diagram, and implement by following coding principles
LO5. Apply testing strategies and handle software product maintenance issues
LO6. Get a good knowledge of the issues and challenges faced while doing Software project Management.
LO7. To understand why the majority of the software projects fail and how that failure probability can be reduced effectively.
LO8. To do the Project Scheduling, tracking, Risk analysis, Quality management, and Project Cost estimation using different techniques.
LO9. Identify and discuss the role and importance of research in the social sciences.
LO10. Identify and discuss the issues and concepts salient to the research process.
LO11. Identify and discuss the complex issues inherent in selecting a research problem, selecting an appropriate research design, and implementing a research project.
LO12. identify and discuss the concepts and procedures of sampling, data collection, analysis, and reporting.

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### Unit I

**Software**: Software Characteristics, Software Process, Process Characteristics, **Software Process Model:** Linear Sequential Model, Prototyping Model, Spiral Model, Software Quality, McCall's Quality Factors, **Software Requirement Analysis and Specification (SRS):** Need Characteristics and Components.

### Unit II

**Planning a Software Project:** COCOMO Model, Project Monitoring Plan, and Risk Management. **Design Principle:** Abstraction, Modularity, Cohesion and Coupling, **Software Management**: Size Oriented Metrics, Function Oriented Metrics. **Testing:** Testing Fundamental, Functional Testing (Black Box), Structural Testing (White Box), Alpha And Beta Testing, **Testing Process:** Comparison of Different Testing, Level of Testing.

### Unit III

Research Methodology: Meaning of Research, Objective of Research, Types of Research, Research Approaches, Significance of research, Research Methods versus Methodology, Research Process, Criteria of Good Research, What is Research Problem, Selecting the problem, Necessity of defining the problem, Technique involved in defining a problem.

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### Recommended Readings

1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, McGraw Hill.

### Suggested Readings

2. Pankaj Jalote, Software Engineering: A Precise Approach, Wiley Precise textbook Series.
3. C. R. Kothari, Research Methodology Methods and Techniques, New Age International Publisher.

**Paper Code:FS-COMP-MSC-CS-CE-303(b)**

**Paper Name: Artificial Intelligence**

**Course Objectives:**

CO1. To analyze and formalize the problem as a state space, graph, design heuristics

CO2. To have the ability to represent solutions for various real-life problem domains using logic-based techniques

CO3. To understand the numerous applications and huge possibilities in the field of AI

CO4. To ability to express ideas in AI research and programming language related to emerging technology.

**Learning Outcomes:**

After completing this course, students will be able to:

LO1. To analyze and formalize the problem as a state space, graph, design heuristics

LO2. Ability to represent solutions for various real-life problem domains using logic-based techniques

LO3. Understand the numerous applications and huge possibilities in the field of AI

LO4. Ability to express ideas in AI research and programming language related to emerging technology.

### Unit I

Definition, History, Agents, and environment, Defining the problem as a state and space search, What is Intelligence? Types of Intelligence, Difference between Human and Machine Intelligence, The Structure of Intelligent Agents. Solving problems by searching: Uninformed search strategies- Brute-Force, Breadth-First, Uniform-cost search Depth-First, Depth-limited search,depth-first search, Bidirectional search. Informed (heuristic) search strategies- Greedy best-first search, A*, AO* Memory-bounded heuristic search.

### Unit II

Heuristic functions, local search algorithms- Hill-climbing search, Simulated annealing, Local beam search. Knowledge-Based System: Knowledge, Procedure V/S Declarative Knowledge, Knowledge Representation: Using Procedural and Predicate Logic, Inference in First-order logic: Unification and Lifting, Forward Chaining, Backward Chaining, Resolution. Rule-based System, Frames, Frames, Scripts, and Semantic Nets.

### Unit III

Probabilistic Reasoning, Probability, and Bayes Theorem represent knowledge in the uncertain domain, Certainty factors, Bayesian Networks, Dempster–Shafer theory, introduction to Fuzzy logic. Learning: types of learning, decision trees. **Expert System: types, architecture. Introduction to A**rtificial Neural Networks, Reinforcement Learning, Natural Language Processing, Pattern Recognition, and Perception.

### Recommended Readings
1. Rich And Knight, Artificial Intelligence, Tata McGraw Hill

### Suggested Readings
2. Patterson, Introduction to Artificial Intelligence and Expert Systems, Prentice-Hall India.
3. Russell and Norvig, Artificial Intelligence A Modern Approach, Prentice Hall.

Paper Code:**FS-COMP-MSC-CS-CE-303(c)**

**Paper Name: Python**

**Course Objectives:**

CO1. Apply language features including strings, lists, tuples, dictionaries, regular expressions.

CO2. Create and call functions.

CO3. Create and manipulate files.

CO4. Develop classes using OO features.

CO5. Develop internet applications using packages such as urllib.

CO6. To understand why Python is a proper scripting language for developers.

CO7. To learn how to design and program Python applications.

CO8. To learn how to use lists, tuples, and dictionaries in Python programs.

CO9. To learn how to identify Python object types.

CO10.To learn how to use indexing and slicing to access data in Python programs.

CO11. To define the structure and components of a Python program.

CO12. To learn how to write loops and decision statements in Python.

CO13. To learn how to write functions and pass arguments in Python.

CO14. To learn how to build and package Python modules for reusability.

CO15. To learn how to read and write files in Python.

CO16. To learn how to design object☐oriented programs with Python classes.

CO17. To learn how to use class inheritance in Python for reusability.

CO18. To learn how to use exception handling in Python applications for error handling.

**Learning Outcomes:**

# Masters in Computer Science (Semester System)
## Choice Based Credit System

After completing this course, students will be able to:

LO1. Apply language features including strings, lists, tuples, dictionaries, regular expressions. LO2. Create and call functions.

LO3. Create and manipulate files.

LO4. Develop classes using OO features.

LO5. Develop internet applications using packages such as urllib.

LO6. To understand why Python is a proper scripting language for developers.

LO7. To learn how to design and program Python applications.

LO8. To learn how to use lists, tuples, and dictionaries in Python programs.

LO9. To learn how to identify Python object types.

LO10.To learn how to use indexing and slicing to access data in Python programs.

LO11. To define the structure and components of a Python program.

LO12. To learn how to write loops and decision statements in Python.

LO13. To learn how to write functions and pass arguments in Python.

LO14. To learn how to build and package Python modules for reusability.

LO15. To learn how to read and write files in Python.

LO16. To learn how to design object☐oriented programs with Python classes.

LO17. To learn how to use class inheritance in Python for reusability.

LO18. To learn how to use exception handling in Python applications for error handling.

## Unit I

Basics: Python Interpreter, writing code in Jupyter Notebook, Indentation, comments, importing a module, binary operators, standard scalar data types, typecasting, if-else statements, loops(while, for), pass, range, ternary expressions. Data Structures and Sequences: Tuples, Lists, and slicing, Built-in Sequence functions, Dictionary, Sets; List, Set, and Dict Comprehensions.

## Unit II

Functions: Namespaces, Scope, and Local Functions; Returning Multiple Values, Anonymous (Lambda) Functions, Partial Argument Application, Generators, Errors, and Exception handling. Basic File Handling. Objects and Methods in Python. NumPy: creating N-dimensional arrays, arithmetic with NumPy arrays, basic indexing, and slicing, Psuedorandom number generation.

## Unit III

Pandas: Overview of Series and DataFrames, reading data from csv file, DataFrame operations- working with data using functions like head, tail , info, shape, reshape, columns, isnull, dropna, mean, sum, describe, value_counts, corr, loc, iloc, apply. Matplotlib- plotting basic figures, subplots, line plots, bar plots, histograms, scatter plots. Overview of Scikit-learn, SciPy, networkx. Applications of python.

## Recommended Readings

1. Wes McKinney, Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Ipython, O'Reilly Media.
2. John Shovic and Alan Simpson, Python All-in-One for Dummies, John Wiley & Sons, Inc.

## Suggested Readings

3. Mark Summerfield, Programming in Python 3: A Complete Introduction to the Python Language, Pearson.
4. Swaroop, C. H. A Byte of Python. Python Tutorial.
5. John V. Guttag, Introduction to Computation and Programming Using Python, MIT Press.
6. Mark Lutz, David Ascher, Python, O'Reilly.
7. T. Budd, Exploring Python, TMH.

## Web Resources

1. https://www.learnpython.org/
2. https://nptel.ac.in/courses/106/106/106106212/
3. http://greenteapress.com/thinkpython/thinkpython.pdf
4. Python tutorial: https://docs.python.org/3/tutorial/index.html
8. Python All-in-One for Dummies, by John Shovic and Alan Simpson, John Wiley & Sons, Inc., 2019

**Paper Code:FS-COMP-MSC-CS-CE-303(d)**
**Paper Name: Theory of Computation**

**Course Objectives:**

CO1. able to design Finite Automata machines for given problems;

CO2. able to analyze a given Finite Automata machine and find out its Language;

CO3. able to create Pushdown Automata machine for given CF language(s);
CO4. able to generate the strings/sentences of given context-free languages using its grammar;
CO5. Able to design Turing machines forgivenApplyto identifyInterprettational problem.

**Learning Outcomes:**

After completing this course, students will be able to identify.:

LO1. able to design Finite Automata machines for given problems;

LO2. able to analyze a given Finite Automata machine and find out its Language;

LO3. able to create Pushdown Automata machine for given CF language(s);

LO4. able to generate the strings/sentences of given context-free languages using its grammar;

LO5. Able to design Turing machines forgivenApplyto identifyInterprettational problem.

## Unit I

Languages: Alphabets, string, language, Basic Operations on language, Concatenation, KleeneStar. Finite Automata and Regular Languages: Regular Expressions, Transition Graphs, Deterministic and non-deterministic finite automata, NFA to DFA Conversion, Regular languages and their relationship with finite automata, Pumping lemma  and closure properties of regular languages.

## Unit II

Context-free languages: Context-free grammars, parse trees, ambiguities in grammars and languages, Pushdown automata (Deterministic and Non-deterministic), Pumping Lemma, Properties of context-free languages,  normal forms.

## Unit III

Turing Machines and Models of Computations: RAM, Turing Machine as a model of computation, Universal Turing Machine, Language acceptability, decidability, halting problem, Recursively enumerable and recursive languages,  unsolvability problems.

## Recommended Readings

1. Daniel I.A., Cohen, Introduction to computer theory, John Wiley.
2. Lewis & Papadimitriou, Elements of the theory of computation, PHI.

## Suggested Readings

1. Hopcroft, Aho, Ullman, Introduction to Automata Theory, Language & Computation, Pearson Education.
2. P. Linz, An Introduction to Formal Language and Automata, 4th edition Jones Bartlett Publication .

**Paper Code:FS-COMP-MSC-CS-EO-304(a)**

**Paper Name: Data Analysis Using R**

**Course Objectives:**

CO1. To use Jupyter Notebook for interactive computation

CO2. To practice Python features such as lists, dictionaries, and files for the given problem

CO3. To use NumPy functions for array processing

CO4. To apply Pandas Dataframe for data wrangling

CO5. To generate graphs for the given data using Matplotlib

CO6. To understand the basics of R programming in terms of constructs, control statements, string Functions.

CO7. To understand the use of R for Data analytics.

CO8. To conduct your independent data analysis.

CO9. To be able to appreciate and to apply the R programming from a statistical perspective.

**Learning Outcomes:**

After completing this course, students will be able to:

LO1. Use Jupyter Notebook for interactive computation

LO2. Practice Python features such as lists, dictionaries, and files for the given problem

LO3. Use NumPy functions for array processing

LO4. Apply Pandas Dataframe for data wrangling

LO5. Generate graphs for the given data using Matplotlib

LO6. Understand the basics of R programming in terms of constructs, control statements, string Functions.

LO7. Understand the use of R for Data analytics.

LO8. Conduct your independent data analysis.

LO9. Able to appreciate and apply the R programming from a statistical perspective.

# Masters in Computer Science (Semester System)
## Choice Based Credit System

### Unit I
Foundations for data analysis-matrices, the notion of probability, the concept of random variables and various distributions, mean, variance, covariance, normal distributions, an overview of sampling, hypothesis testing, confidence interval, the concept of optimization.

### Unit II
installation of R, data editing, use of R as a calculator; functions, and assignments. matrix operations, logical operators, Conditional executions and loops, data management with sequences, repeats, sorting and ordering, lists, vector indexing, factors; display and formatting of strings.

### Unit III
Working with data frames, Importing data files; Graphics and plots; basic statistical functions for central tendency, variation, box plots, skewness and kurtosis, correlations; overview of using R functions for simple hypothesis testing,  Applications of R.

### Recommended Readings
1. Garrett Grolemund, Hands-On Programming with R, O'Reilly Publishers.
2. R for Beginner - https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf

### Suggested Readings
3.  A Learning Guide to R   -
https://www.westernsydney.edu.au/__data/assets/pdf_file/0011/830909/Rnotes_20180905_web.pdf
4. Douglas Montgomery, Applied Statistics And Probability For Engineers, John Wiley & Sons Inc.
5. C.R. Kothari, Research Methodology: Methods And Techniques, New Age International Publishers.
6. Montgomery, Douglas C, Design and Analysis of Experiments, Wiley India.

**Paper Code:FS-COMP-MSC-CS-EO-304(b)**
**Paper Name : LaTeX: a document preparation system**

## Course Objectives:
CO1. To apply various Excel tools and add-ins for analyzing Business problems.
CO2. To compare mathematical formulas with Spreadsheet formulas
CO3. To explore, query, and summarize business data.
CO4. To apply descriptive statistical measures for business decisions.
CO5. To perform progression analysis and forecasting techniques.
CO6. To understand how to write documents containing mathematical formulas.
CO7. To understand how to write articles in different journal styles.
CO8. To understand how to create PPT in a more presentable manner.
CO9. To understand how to create using built-in templates.

## Learning Outcomes:
After completing this course, students will be able to:
LO1. Apply various Excel tools and add-ins for analyzing Business problems.
LO2. Compare mathematical formulas with Spreadsheet formulas
LO3. Explore, query, and summarize business data.
LO4. Apply descriptive statistical measures for business decisions.
LO5. Perform progression analysis and forecasting techniques.
LO6. Understand how to write documents containing mathematical formulas.
LO7. Understand how to write articles in different journal styles.
LO8. Understand how to create PPT in a more presentable manner.
LO9. Understand how to create using built-in templates.

### Unit I
Installation of the software LaTeX, Structure of LaTeX documents; Special Characters, Producing equations, Matrices, Tables, itemized lists, hypertext links; Page Layout –Title, Abstract, Chapters, Sections, References.

### Unit II
Including graphics, images, floating bodies;  Producing basic mathematical graphics like line segments, arrows, circles, ovals, Generating index and bibliography, creating a PDF file.

### Unit III
Adding a new command; generating spaces, colored text; Writing a  sample resume, question paper, article/ research paper; Creating a presentation using beamer.
of part A, B and C are 50, 200 and 500 respectively

### Recommended Readings
1. Leslie Lamport, LaTeX: A Document Preparation System, Addison- Wesley.

# Masters in Computer Science (Semester System)
## Choice Based Credit System

**Suggested Readings**

2. Stefan Kottwitz, LaTeX Beginner's Guide, Packt Publishing Limited.

3. Tobias Oetiker, Hubert Partl, Irene Hyna, and Elisabeth Schegle, The Not So Short Introduction to LaTeX 2e, https://tobi.oetiker.ch/lshort/lshort-a5book.pdf, 2014.

**Paper Code:FS-COMP-MSC-CS-EO-304(c)**
**Paper Name: Natural Language Processing**

**Course Objectives:**

CO1. To have an introduction of the fundamental concepts and techniques of natural language processing (NLP).

CO2. To gain an in-depth understanding of the computational properties of natural languages and the commonly used algorithms for processing linguistic information.

CO3. To examine NLP models and algorithms using both the traditional symbolic and the more recent statistical approaches.

CO4. To understand critical concepts from NLP are used to describe and analyze language.

CO5. To perform POS tagging and context-free grammar for the English language.

CO6. To understanding semantics and pragmatics of English language for processing·

CO7. To write programs in Python to carry out natural language processing

**Learning Outcomes:**

After completing this course, students will be able to-

LO1. Introduction to the fundamental concepts and techniques of natural language processing (NLP).

LO2. Students will gain an in-depth understanding of the computational properties of natural languages and the commonly used algorithms for processing linguistic information.

LO3. The course examines NLP models and algorithms using both the traditional symbolic and the more recent statistical approaches.

LO4. Critical concepts from NLP are used to describe and analyze language.

LO5. POS tagging and context-free grammar for the English language.

LO6. Understanding semantics and pragmatics of English language for processing·

LO7. Writing programs in Python to carry out natural language processing

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## Unit I

Introduction, Basics of text processing, Spelling Correction: Edit Distance; N-Gram Language Models, Evaluation of Language Models, Basic Smoothing,  Computational Morphology, Introduction to POS Tagging, Overview of Hidden Markov Model, Basics of Models for Sequential tagging – Introduction to Maximum entropy and Conditional Random Fields.

## Unit II

Constituency syntax parsing, examples of parsing using CKY and PCFG, Introduction to Dependency Grammars and Parsing, understanding of Transition Based Parsing; Distributional Semantics - Introduction, Applications; Word Embedding: Frequency-based embedding, Prediction based embeddings. Lexical Semantics: an overview of WordNet, Word Sense Disambiguation.

## Unit III

Topic models: introduction, LDA; Introduction to Entity Linking and Information Extraction; Text Summarization: an overview of various approaches; Text Classification: introduction and simple practical implementation using Python. Sentiment Analysis: Concept, Analysis, and Applications.

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**Required Readings**

1.  James Allen, Natural Language Understanding, Pearson Education; 2nd edition.
2.  Jurafsky / Martin. Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition, 2e.
3.  Nitin Indurkhya, Fred J. Damerau, Handbook of Natural Language Processing,  Taylor and Francis; Second edition.
4.  Alexander Clark, Chris Fox, Shalom Lappin, The Handbook of Computational Linguistics and Natural Language Processing, Wiley-Blackwell; 1st edition
5.  Steven Bird, Ewan Klein, Edward Loper, Natural Language Processing with Python: Analysing Text with the Natural Language Toolkit,  Shroff pub.
6.  Christopher D. Manning, Hinrich Schütze, Foundations of Statistical Natural Language Processing, MIT press.

**Suggested Readings**

1.  Frederick Jelin, Statistical Methods for Speech Recognition (Language, Speech, and Communication) Fourth Printing Edition.

2. Yoav Goldberg, Graeme Hirst, Morgan and Claypool, Neural Network Methods for Natural Language Processing Synthesis Lectures on Human Language Technologies, Life Sciences.

**Paper Code:FS-COMP-MSC-CS-EO-303(d)**
**Paper Name: Introduction to Cyber Security**

**Course Objectives:**
CO1. To identify and classify various attacks
CO2. To encrypt and decrypt messages using block chippers and signs.
CO3. To create a digital signature using multiple algorithms.
CO4. To describe web security, intruders, viruses, and firewalls

**Learning Outcomes:**
After completing this course, students will be able to-
LO1. Identify and classify various attacks
LO2. Encrypt and decrypt messages using block chippers and signs.
LO3. Create a digital signature using multiple algorithms.
LO4. Describe web security, intruders, viruses, and firewalls

### Unit I
Basics: Linux/Mac Terminal and Commands, Basic Computer Terminology, Computer Security models, Computer Security Terms, Computer Ethics, Business, and Professional Ethics, Need for cyber security; Cyber Frauds and crimes, Digital Payments, Various Search Engines, Introduction to Auditing, Deep Web, VAPT, Smartphone Operating systems, introduction to compliances, Globalization and borderless world.

### Unit II
Basic Python Scripting: Python Basics, Variables, and Types, Lists, Basic Operators, String Formatting, Basic String Operations, Conditions, Loops, Functions, Classes and Objects, Dictionaries, Modules, and Packages.

### Unit III
Cyber Laws: Need for Cyber Regulations; Scope and Significance of Cyber laws: Information Technology Act 2000; Network and Network Security, Access and Unauthorised Access, Data Security, E Contracts and E Forms. Penal Provisions for Phishing, Spam, Virus, Worms, Malware, Hacking, Trespass, and Stalking; Human rights in cyberspace, International Co-operation in investigating cybercrimes.

### Recommended Readings
1. Behrouz A. Forouzan (2004). Data communication and Networking. Tata McGraw-Hill.
2. Kurose, James F. & Ross, Keith W. (2003). Computer Networking: A Top-Down Approach Featuring the Internet (3rd Ed.). Pearson Education.
3. Langtangen, H.P. (2012). Python Scripting for Computational Science (4th Ed.). Springer
4. Craig, B. (2012). Cyber Law: The Law of the Internet and Information Technology. Pearson. Sharma J. P. & Kanojia S. (2016). Cyber Laws. New Delhi: Ane Books Pvt Ltd.
5. Paintal, D. Law of Information Technology. New Delhi: Taxmann Publications Pvt. Ltd

### Suggested Readings
1. Shema, M. (2012). Hacking Web Apps: Detecting and Preventing Web Application Security Problems.
2. https://uou.ac.in/sites/default/files/slm/Introduction-cyber-security.pdf
3. Computer Programming And Cyber Security for Beginners: This Book Includes: Python Machine Learning, SQL, Linux, Hacking with Kali Linux, Ethical Hacking. Coding and Cybersecurity Fundamentals, Zach Codings, Independently published

### Semester IV

**Paper Code:FS-COMP-MSC-CS-CC-401**
**Paper Name: Computer Graphics & Multimedia**

**Course Objectives:**
CO1. To develop line and circle generation algorithms
CO2. To apply 2D and 3D transformations
CO3. To develop clipping algorithms for point, line, and polygons
CO4. To learn the concepts of projections, viewing, and graphics pipeline
CO5. To create a simple animation and interaction for multimedia presentation
CO6. To understand image types and color models
CO7. To describe the concepts regarding the digitization of audio signals
CO8. To compress images, videos, and audios using data compression methods

CO9. To encode videos and audios using MPEG

CO10. To ExplainfunctionalIdentify the core concepts of computer graphics, including viewing, projection, perspective, modeling, and transformation in two and three dimensions.

CO11. To apply the concepts of color models, lighting and shading models, textures, ray tracing, hidden surface elimination, anti-aliasing, and rendering.

CO12. To interpret the mathematical foundation of the concepts of computer graphics.

CO13. To describe the fundamentals of animation, parametric curves, and surfaces, and spotlighting.

CO14. To identify a typical graphics pipeline and apply graphics programming techniques to design and create computer graphics.

CO15. To create effective OpenGL programs to solve graphics programming issues, including 3D transformation, object modeling, color modeling, lighting, textures, and ray tracing.

CO16. To understand multimedia concerning any applications, including business, schools, home, education, and virtual reality.

CO17. To understand the hardware and software needed to create projects using creativity and organization to create them.

CO18. To develop multimedia skills to be the principal player of individual multimedia teams in developing projects.

CO19. To work with all aspects of images.

CO20. To work with all aspects of sound.

CO21. To work with all aspects of the video.

CO22. To learn copyright laws associated with multimedia.

CO23. To learn the cost involved in multimedia planning, designing, and producing.

CO24. To learn ways to present their multimedia projects.

**Learning Outcomes:**

After completing this course, students will be able to:

LO1. Develop line and circle generation algorithms

LO2. Apply 2D and 3D transformations

LO3. Develop clipping algorithms for point, line, and polygons

LO4. Learn the concepts of projections, viewing, and graphics pipeline

LO5. Create a simple animation and interaction for multimedia presentation

LO6. Understand image types and color models

LO7. Describe the concepts regarding the digitization of audio signals

LO8. Compress images, videos, and audios using data compression methods

LO9. Encode videos and audios using MPEG

LO10. ExplainfunctionalIdentify the core concepts of computer graphics, including viewing, projection, perspective, modeling, and transformation in two and three dimensions.

LO11. apply the concepts of color models, lighting and shading models, textures, ray tracing, hidden surface elimination, anti-aliasing, and rendering.

LO12. interpret the mathematical foundation of the concepts of computer graphics.

LO13. Describe the fundamentals of animation, parametric curves, and surfaces, and spotlighting.

LO14. Identify a typical graphics pipeline and apply graphics programming techniques to design and create computer graphics.

LO15. Create effective OpenGL programs to solve graphics programming issues, including 3D transformation, object modeling, color modeling, lighting, textures, and ray tracing.

LO16. Students will understand multimedia concerning any applications, including business, schools, home, education, and virtual reality.

LO17. Students will understand the hardware and software needed to create projects using creativity and organization to create them.

LO18. The student will develop multimedia skills to be the principal player of individual multimedia teams in developing projects.

LO19. Students will work with all aspects of images.

LO20. Students will work with all aspects of sound.

LO21. Students will work with all aspects of the video.

LO22. Students will learn copyright laws associated with multimedia.

LO23. Students will learn the cost involved in multimedia planning, designing, and producing.

LO24. Students will learn ways to present their multimedia projects.

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## Unit I

Basic elements of Computer Graphics, Graphics display devices, Applications of Computer Graphics, Raster and random scan; Color Models: RGB, CMY, HSV; Graphics Standard: OpenGL; Scan Conversion: DDA line

algorithm, Midpoint circle Algorithm. 2D Transformation: Translation, Rotation, Scaling, Homogeneous Coordinates and Matrix Representation of 2D Transformation, Composite Transformation.

### Unit II

3D Graphics: Matrix Representation of 3D transformations, Translation, Rotation, Scaling, Composite Transformation. Overview of concepts: Clipping, orthographic and parallel projection, hidden surface removal, lighting, transparency, modeling and texturing, rendering; Animations: Principles of animations, keyframing, the concept of 2D and 3D animation.

### Unit III

Blender: GUI Interface, Selecting, rotating, and Translating Objects, Using Snap to move objects precisely, Creating mesh primitives and extrusions, Subdividing meshes, Creating a simple creature, Joining mesh objects and stitching vertices, Organizing a scene with layers, groups, and hierarchies, Assigning glossy and reflective materials to objects, Creating bump maps, Creating sky and ambient light, Understanding ambient occlusion, Adding motion blur and depth of field, Editing animation in the Graph Editor, Building and animating a simple character.

### Recommended Readings

1. Foley, van Dam, Feiner and Hughes, Computer Graphics (Principles and Practice), Addison Wesley (Indian Edition).
2. D Hearn and PM Baker, Computer Graphics, Prentice Hall of India (Indian Edition).

### Suggested Readings

3. DF Roger, Mathematical Elements for Computer Graphics.
4. Krishnamurthy N, Introduction to Computer Graphics, Tata McGraw Hill.
5. Zhigang X. and Plastock Ra, Theory and Problems of Computer Graphics (Schaum's Outline), Tata McGraw Hill.

### Web Resources

1. https://www.cs.duke.edu/brd/Teaching/Previous/Animation/animation.html
2. http://zikky.lecturer.pens.ac.id/Produksi 3D untuk Designer/Beginning Blender-book.pdf
3. http://www.blenderhd.com/wp-content/uploads/2015/08/BeginnersGuideToBlender.pdf
4. https://people.sc.fsu.edu/~gerlebacher/gd/blender/blender/blender_noob_to_pro.pdf
5. http://download.blender.org/documentation/pdf/John M Blain - An Introduction To Blender 3D - A Book For Beginners (2011).pdf
6. http://www.cdschools.org/cms/lib04/PA09000075/Centricity/Domain/81/BlenderBasics_4thEdition2011.pdf
7. **https://docs.blender.org/manual/en/dev/index.html**

**Paper Code:FS-COMP-MSC-CS-CC-402**
**Paper Name: Android Programming**

**Course Objectives:**
CO1. To create an android project from XML Layout.
CO2. To debug Android apps and create UI fragments
CO3. To pass data between fragments
CO4. To design apps with audio playback.
CO5. To create a database and communicate with mobile apps
CO6. To install and configure Android application development toolsCO7. To design and develop user interfaces for the Android platform.
CO8. To save state information across important operating system events.
CO9. To apply Java programming concepts to Android application development.
CO10. To develop the ability to develop Android Application

**Learning Outcomes:**
After completing this course, students will be able to:
LO1. Create an android project from XML Layout.
LO2. Debug Android apps and create UI fragments
LO3. Pass data between fragments
LO4. Design apps with audio playback.
LO5. Create database and communicate with mobile apps
LO6. Install and configure Android application development tools.
LO7. Design and develop user interfaces for the Android platform.
LO8. Save state information across important operating system events.
LO9. Apply Java programming concepts to Android application development.
LO10. Develop the ability to develop Android Application

### Unit -I

Introduction: What is Android?, Android Architecture, Setting Android Environment, Android SDK Manager & required Packages, Using Android Studio, Android Virtual Device(AVD), Creating First Android Application, Package Structure, Introduction to Gradle, Running the Application, Views, Layouts and more.

### Unit – II
Introduction to Views: TextView, EditText View, RadioButton and CheckBox View, Button View, ImageView and ImageButton View, Toast, Notifications.

Introduction to Layouts/ViewGroups: Linear Layout, Relative Layout, Tabular Layout, Hierarchical Layout Arrangements, Adapter, and Adapter View, Using ListView and GridView, SQLite Database.

### Unit – III
Spinner in Android, Working with Spinners, Margin and Padding, Working with EditText and TextView, RadioGroup, RadioButton and CheckBox, AutoCompleteTextView in Android, Android Core, and Projects.

Location-Based Services: Sending Email, Sending SMS, Phone Calls

Activity in Android, Intents in Android, Introduction to Fragments, Working with Fragments

### Recommended Readings
1. Android Programming for Beginners by John Horton Publisher: Packt Publishing
2. Learn Java for Android Development (2nd edition) by Jeff Friesen Publisher: Apress

### Suggested Readings
3. **James C. Sheusi, Android application development for java programmers, Cengage Learning.**
4. **Jerome F. DiMarzio, Beginning Android Programming with Android Studio, Fourth Edition, John Wiley & Sons.**
5. **Kristin Marsicano , Chris Stewart , Bill Phillips, Programming: The Big Nerd Ranch Guide, Big Nerd Ranch Guides.**

**Paper Code:FS-COMP-MSC-CS-CE-403(a)**
**Paper Name : Cloud Computing**

**Objective –** After completing this course the student will have an understanding of key aspects of cloud computing

### Unit I
Introduction to Cloud Computing, Services provided by cloud-SaaS, PaaS, IaaS, DaaS, etc. Functioning of cloud computing, Advantages, Disadvantages, Applications, Cloud Service Providers- Amazon AWS, Google App Engine, Microsoft, VMware. Virtualization concepts, Objectives, Types of Virtualization & its benefits, Introduction to Various Virtualization OS (Hypervisor). Virtualization for Enterprises

### Unit II
Designing and Implementing a Data Center-Based Cloud, Industry and International Standards for Cloud Implementation, Building private cloud using open source tools, Integration of Public and Private Cloud. Private, Public & Hybrid Clouds, their Advantages & Disadvantages, On-Premises and Off-Premises Cloud services, installing a Cloud service.

### Unit III
Cloud Security issues - Infrastructure Security, Network level security, Host level security, Application-level security, Data privacy and security Issues, Jurisdictional issues raised by Data location, Access Control, Trust, Reputation, Risk, and Authentication in cloud computing

### Suggested Readings
1. Thomas Erl, Cloud Computing Concepts Technology and Architecture, Prentice Hall.
2. Rajkumar Buyya, James Broberg and Andrzej Goscinski, Cloud Computing Principles and paradigms, John Wiley and Sons, Inc. Publication.
3. Dan C. Marinescu,Cloud Computing Theory and Practice, Morgon Kaufman Publication.

**Paper Code:FS-COMP-MSC-CS-CE-403(b)**
**Paper Name: Internet of Things**

**Course Objectives:**
CO1. To understand the definition and significance of the Internet of Things
CO2. To discuss the architecture, operation, and business benefits of an IoT solution
CO3. To examine the potential business opportunities that IoT can uncover
CO4. To explore the relationship between IoT, cloud computing, and big data
CO5. To identify how IoT differs from traditional data collection systems
CO6. To understand the definition and significance of the Internet of Things
CO7. To discuss the architecture, operation, and business benefits of an IoT solution

CO8. To examine the potential business opportunities that IoT can uncover
CO9. To explore the relationship between IoT, cloud computing, and big data
CO10. To identify how IoT differs from traditional data collection systems.
**Learning Outcomes:**
After completing this course, students will be able to:
LO1. Understand the definition and significance of the Internet of Things
LO2. Discuss the architecture, operation, and business benefits of an IoT solution
LO3. Examine the potential business opportunities that IoT can uncover
LO4. Explore the relationship between IoT, cloud computing, and big data
LO5. Identify how IoT differs from traditional data collection systems
LO6. Understand the definition and significance of the Internet of Things
LO7. Discuss the architecture, operation, and business benefits of an IoT solution
LO8. Examine the potential business opportunities that IoT can uncover
LO9. Explore the relationship between IoT, cloud computing, and big data
LO10. Identify how IoT differs from traditional data collection systems.

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### Unit I

M2M to IoT: Introduction, Market Perspective, Architectural Overview. M2M to IoT Technology- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, IoT analytics, Knowledge management, IOT Architecture, Architecture Reference Model, Real-world design constraints.

### Unit II

IoT Use Cases- Asset Management, **Industrial Automation-** Service-oriented architecture-based device integration, SOCRADES: realizing the enterprise integrated Web of Things, IMC-AESOP: from the Web of Things to the Cloud of Things, **Commercial Building Automation-** Introduction, Case study: phase one-commercial building automation today, Case study: phase two- commercial building automation in the future.

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### Unit III

Internet of Things Privacy, Security and Governance Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, IOT and Smart Cities, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security

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### Recommended Readings

Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence, 1st Edition, Academic Press.

1. Vijay Madisetti and Arshdeep Bahga, Internet of Things (A Hands-on-Approach), 1stEdition, VPT.
2. Francis daCosta, Rethinking the Internet of Things: A Scalable Approach to Connecting Everything, 1st Edition, Apress Publications.
3. Hakim Cassimally, Designing the Internet of Things , Adrian McEwen (Author).
4. Dr. Ovidiu Vermesan, Dr. Peter Friess. Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems, River Publishers.
5. Vijay Madisetti , Arshdeep Bahga, Internet of Things, A Hands-on-Approach.
6. Daniel Minoli, Building the internet of things with ipv6 and mipv6, The Evolving World of M2M Communications, John Wiley & Sons.

**Paper Code:FS-COMP-MSC-CS-CE-403(c)**
**Paper Name: Big Data & Data Mining**

**Course Objectives:**
CO1. To explain characteristics and use cases and applications of Big Data
CO2. To develop MapReduce operation using Hadoop
CO3. To be able to understand the role of Virtualization Technologies
CO4. To design and implement systems for data mining.
CO5. To evaluate the performance of different data-mining algorithms.
CO6. To propose data-mining solutions for various applications.
**Learning Outcomes:**
After completing this course, students will be able to:
LO1. Explain characteristics and use cases and applications of Big Data
LO2. Develop MapReduce operation using Hadoop
LO3. Ability to understand the role of Virtualization Technologies
LO4.design and implement systems for data mining.

LO5. Evaluate the performance of different data-mining algorithms.
LO6. Propose data-mining solutions for various applications.

### Unit I

Data mining Introduction: Definition, Data mining tasks, Data mining as a step of the Knowledge discovery process, Applications of Data mining; Data objects and types of attributes, Recalling mean, median, mode, and weighted arithmetic mean, Data quality, an overview of data preprocessing.

### Unit II

Classification analysis- definition, Overview of various classification techniques; Decision tree induction-working, examples, specifying attribute test conditions, Measures of node impurity, measures for selecting best split; Evaluating the performance of a classifier- Holdout method, Random subsampling, cross-validation, Bootstrap.

### Unit III

Association analysis: support, confidence, association rules, Frequent Itemsets; Frequent itemset generation - Apriori principle, Apriori algorithm, and examples, FP growth algorithm, and examples; Closed and maximal frequent itemsets. Cluster analysis: Definition, an overview of basic clustering methods, Density-based methods-DBSCAN.

### Recommended Readings

1. Jiawei Han and Micheline Kamber, Data Mining: Concepts and Techniques, 3rd edition.
2. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Education.

### Suggested Readings

3. Richard Roiger, Michael Geatz, Data Mining: A Tutorial Based Primer, Pearson Education.
4. G.K. Gupta, Introduction to Data Mining with Case Studies, PHI.
5. Soman K. P., DiwakarShyam, Ajay V., Insight into Data mining: Theory and Practice, PHI.
6. Witten, Frank, Data Mining:: Practical Machine Learning Tools and Techniques (Morgan Kaufmann Series in Data Management Systems) Prentice Hall.

**Paper Code:FS-COMP-MSC-CS-CE-403(d)**
**Paper Name: Machine Learning**

**Course Objectives:**
CO1. To be able to design Finite Automata machines for given problems;
CO2. To be able to analyze a given Finite Automata machine and find out its Language;
CO3. To be able to create Pushdown Automata machine for given CF language(s);
CO4. To be able to generate the strings/sentences of given context-free languages using its grammar;
CO5. To be able to design Turing machines forgivenApplyto identifyInterprettational problem.

**Learning Outcomes:**
After completing this course, students will be able to-
LO1. Able to design Finite Automata machines for given problems;
LO2. Able to analyze a given Finite Automata machine and find out its Language;
LO3. Able to create Pushdown Automata machine for given CF language(s);
LO4. Able to generate the strings/sentences of given context-free languages using its grammar;
LO5. Able to design Turing machines forgivenApplyto identifyInterprettational problem.

### Unit I

Introduction: Concept of Machine Learning, Applications of Machine Learning, Key elements of Machine Learning, Supervised vs. Unsupervised Learning, Statistical Learning: Bayesian Method, The Naive Bayes Classifier. Tools for Machine Learning and Linear Algebra Overview: Plotting of Data, Vectorization, Matrices, and Vectors: Addition, Multiplication, Transpose and Inverse using available tools/libraries with Python.

### Unit II

Linear Regression: Prediction using Linear Regression, Gradient Descent, Linear Regression with one variable, Linear Regression with multiple variables, Polynomial Regression, Feature Scaling/Selection. Logistic Regression: Classification using Logistic Regression, Logistic Regression vs. Linear Regression, Logistic Regression with one variable and with multiple variables.

### Unit III

Regularization: Regularization and its utility: The problem of Overfitting, Application of Regularization in Linear and Logistic Regression, Regularization and Bias/Variance. Neural Networks: Introduction, Model Representation, Gradient Descent vs. Perceptron Training, Stochastic Gradient Descent, Multilayer Perceptrons, Multiclass Representation, Backpropagation Algorithm.

**Recommended Readings**
1. Tom M. Mitchell, Machine Learning, First Edition, Tata McGraw-Hill Education.
2. Ethem Alpaydin, Introduction to Machine Learning, 2nd Edition, The MIT Press.
3. Christopher M. Bishop, Pattern Recognition and Machine Learning, Springer.
4. Mevin P. Murphy, Machine Learning: A Probabilistic Perspective, The MIT Press.

**Suggested Readings**
1. John Paul Mueller, Luca Massaron, Machine Learning For Dummies, For Dummies; 1st edition.
2. O Theobald, Machine Learning for Absolute Beginners: A Plain English Introduction, Scatterplot Press; 2nd edition.
3. Andreas C. Müller, Sarah Guido, Introduction to Machine Learning with Python: A Guide for Data Scientists, O′Reilly; 1st edition
4. https://www.cmpe.boun.edu.tr/~ethem/i2ml3e/

**Paper Code:FS-COMP-MSC-CS-CC-404-405**
**Paper Name: Combined Practical & Project/Dissertation/Industrial Training**

**Course Objectives:**
CO1. Identify and define the problem statement
CO2. Define and justify the scope of the proposed problem
CO3. Gather and analyze system requirements
CO4. Propose an optimized solution among the existing solutions
CO5. Practice software analysis and design techniques
CO6. Develop technical report writing and oral presentation skills
CO7. Develop a functional application based on the software design
CO8. Apply to code, debugging, and testing tools to enhance the quality of the software
CO9. Prepare the proper documentation of software projects following the standard guidelines
CO10. Become a master in specialized technology
CO11. Become updated with all the latest changes in the technological world.
CO12. Ability to communicate efficiently.
CO13. Ability to be a multi-skilled engineer with sound technical knowledge, management, leadership, and entrepreneurship skills.
CO14. Capability and enthusiasm for self-improvement through continuous professional development and life-long learning
CO15. Awareness of the social, cultural, global, and environmental responsibility of an engineer.
Learning Outcomes
After completing this course, students will be able to:
LO1. Identify and define the problem statement
LO2. Define and justify the scope of the proposed problem
LO3. Gather and analyze system requirements
LO4. Propose an optimized solution among the existing solutions
LO5. Practice software analysis and design techniques
LO6. Develop technical report writing and oral presentation skills
LO7. Develop a functional application based on the software design
LO8. Apply to code, debugging, and testing tools to enhance the quality of the software
LO9. Prepare the proper documentation of software projects following the standard guidelines
L10. Become a master in specialized technology
LO11. Become updated with all the latest changes in the technological world.
LO12. Ability to communicate efficiently.
LO13. Ability to be a multi-skilled engineer with sound technical knowledge, management, leadership, and entrepreneurship skills.
LO14. Capability and enthusiasm for self-improvement through continuous professional development and life-long learning
LO15. Awareness of the social, cultural, global, and environmental responsibility of an engineer.

**Practical Training and Project Work:**
1. Project Work may be done individually or in groups in case of bigger projects. However, if the project is done in groups, each student must be given responsibility for a distinct module and care should be taken to monitor the individual student.
2. Project Work can be carried out in the college or outside with prior permission of the college.
3. The Student must submit a synopsis of the project report to the college for approval. The Project Guide can accept the project or suggest modification for resubmission. Only on acceptance of the draft project report, the student should make the final copies.

**Submission Copy:**

The Student should submit a spiral-bound copy of the project report.

**Format of the Project:**
1. **Paper:**
   The Report shall be typed on White Paper of A4 size.
2. **Final Submission:**
   The Report to be submitted must be original.
3. **Typing:**
   **Font:**- Times New Roman
   **Heading:-** 16 pt., Bold
   **Subheading:-** 14 pt, Bold
   **Content:-** 12 pt.
   **Line Spacing:-** 1.5 lines.
   **Typing Side :-**One Side
   **Font Color:-** Black.
4. **Margins:**
   The typing must be done in the following margin:
   **Left** : 0.75"
   **Right**: 0.75"
   **Top**: 1"
   **Bottom**: 1"
   **Left Gutter:** 0.5"
5. **Binding:**
   The report shall be Spiral Bound.
6. **Title Cover:**
   The Title cover should contain the following details:
   **Top:** Project Title in block capitals of 16pt.
   **Centre:** Name of project developer's and Guide name.
   **Bottom:** Name of the university, Year of submission all in block capitals of 14pt letters on separate lines with proper spacing and centering.
7. **Blank sheets:**
   At the beginning and end of the report, two white blank papers should be provided, one for the Purpose of Binding and other to be left blank.
8. **Content:**
   I). Acknowledgment
   II). Institute/College/Organization certificate where the project is being developed.
   III). Table of contents
   IV). A brief overview of the project
   V). Profiles of problems assigned
   VI). Study of Existing System
   VII). System Requirement
   VIII). Project plan
   - Team Structure
   - Development Schedule
   - Programming language and Development Tools
   IX). Requirement Specification
   X). Design
   - Detailed DFD and Structure Diagram
   - Data structure, Database and File Specification

   XI). Project Legacy
   - Current Status of project

# Masters in Computer Science (Semester System)
## Choice Based Credit System

- Remaining Areas of concern
- Technical and Managerial Lessons Learnt
- Future Recommendations
  - Nomenclature and Abbreviations.
  - Bibliography
  - Source Code

## Teaching-Learning Process

The teaching learning process may include the following-
- Lectures
- Discussions
- Simulations
- Virtual Labs
- Role Playing
- Participative Learning
- Interactive Sessions
- Seminars
- Research-based Learning/ Dissertation/ Case Study/ Project Work

The Blended Learning mode of teaching and learning is preferable in which offline (face-to-face) and online learning both are used to provide learners the opportunity to enjoy both of the worlds. Teachers can share instructions, lecture notes, and assignments online. On the other hand, students can share information/work/assignments with teachers and other students directly in a collaborative setting. This may have a more enriched learning experience, and collaboration between students can be improved upon if group activities rely on information gathered from online resources or lessons. Students who complete online coursework followed by interactive, face-to-face class activities have richer educational experiences.

## Assessment and Evaluation

- A comprehensive and continuous evaluation by mid-semester examinations at regular intervals to find out each course level learning outcome
- Formative assessment on the basis of activities of a learner throughout the program instead of one assessment. for this provision of internal exams, student seminars, and assignments is included
- Open book exam is suggested for internal/ mid-term exams to better facilitate the understanding of the knowledge required
- Group examinations are recommended on problem-solving exercises and in major projects to enhance the teamwork capabilities of the learner
- Collaborative/Individual assignments are useful to enhance the capability of learners to gain domain-specific knowledge
- Student Seminars and Quizzes are recommended for the continuous learning and evaluation process

## ELIGIBILITY FOR ADMISSION

Graduates possessing 50% marks in any faculty of any statutory university shall be eligible for admission to the M.Sc. Computer Science Course (Relaxation to SC/ST etc. as per Prevailing Rules)

## PASS CRITERIA

For passing in the examination, a candidate is required to obtain at least a Satisfactory Grade in each paper (Internal + External) and also acquire a Satisfactory Grade in theory and practical separately (in each semester examination).

## INSTRUCTIONS TO PAPER SETTER

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit). **Section-B** will consist of 9 questions (3 questions from each unit). **Section C** will consist of 6 questions (2 questions from each unit).
The word limit of parts A, B, and C are 50, 200, and 500 respectively

## INSTRUCTIONS FOR PRACTICAL EXAMINATION

Marks Distribution for Practical Exam -
Each practical exam is to be conducted by two examiners one External and one Internal. The external examiner should be a senior lecturer from the jurisdiction of other universities. Credit Weightage distribution for external practical of 4 credits is as under
a) Practical Examination exercise of 3 questions     2 credits
b) Viva-Voce     1 credit
c) Laboratory Exercise File     1 credit
Marks distribution for External Project report of 40 marks is as under
     External Evaluation-
          Research Project/ Case Study     2 credits

# Masters in Computer Science (Semester System)
## Choice Based Credit System

| | |
|---|---|
| Presentation | 1 credit |
| External Viva Voce | 1 credit |
| Internal Evaluation- Dissertation | 1 credit |

## INSTRUCTIONS FOR STUDENTS

The student has to complete two months of career-oriented summer training from any firm/organization. If the student does not get a chance to go for training, he/she can choose a research topic and can complete the dissertation under the supervision of any of the faculty in his college.

The student who has to opt for training has to provide a signed certificate from the firm/ organization authority stating that the student has spent two months as a trainee in his organization/firm. The student who has opted for a dissertation has to submit his/her dissertation report with a certificate from his supervisor.

In both cases, the student has to present his work in front of all the faculty members and fellow students at the starting of the next session.

In terms of credits, every one-hour session of L amounts to 1 credit per semester and a minimum of two-hour sessions of T or P amounts to 1 credit per semester.

**\* An Academic/ Industrial Tour shall be organized by the college/department in every session. A Tour Report shall be prepared and submitted by the students after a study tour to industries/academic institutions of repute.**

### EVALUATION

| | | |
|---|---|---|
| Internal Assessment - | Midterm Examination | 10% |
| | Term paper | 10% |
| | Students Participation | 5% |
| External Assessment- | 75% | |

### Examination Paper Pattern

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit). **Section-C** will consist of 6 questions (2 questions from each unit). The word limit of part A, B and C are 50, 200 and 500 respectively

## Key Features of Revised Curriculum

Following are the key features of the revised curriculum-
- Student Centric Teaching and Learning approach
- Technology oriented approach of teaching
- Hand-on Practical/ Laboratory Sessions
- Problem-oriented teaching and learning
- Problem-analysis oriented assignments and evaluation
- Enhance logical thinking and analytical capabilities

## Appendices

List of Open Electives offered by the University -

M.Sc.(Computer Science) Lateral Entry

M. G. S. UNIVERISTY, BIKANER

SYLLABUS

SCHEME OF EXAMINATION AND

COURSES OF STUDY

**FACULTY OF COMPUTER SCIENCE**

**M.SC. COMPUTER (LATERAL ENTRY)**

# Department of Computer Science



Maharaja Ganga Singh University

Bikaner

**Learning Outcome-based  Curriculum Framework (LOCF)**

**for**

**M.Sc.(Computer Science) Lateral Entry**

# M.Sc.(Computer Science) Lateral Entry

## Table of Contents

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## Background

Considering the curricular reforms as instrumental for desired learning outcomes, all the academic departments of Maharaja Ganga Singh University Bikaner, made a rigorous attempt to revise the curriculum of postgraduate programs in alignment with National Education Policy-2020 and UGC Quality Mandate for Higher Education Institutions-2021. The process of revising the curriculum could be prompted with the adoption of the "Comprehensive Roadmap for Implementation of NEP-2020". The Roadmap identified the key features of the Policy and elucidated the Action Plan with well-defined responsibilities and an indicative timeline for major academic reforms.

The process of revamping the curriculum started with a series of webinars and discussions conducted by the University to orient the teachers about the key features of the Policy, enabling them to revise the curriculum in sync with the Policy. Proper orientation of the faculty about the vision and provisions of NEP-2020 made it easier for them to appreciate and incorporate the vital aspects of the Policy in the revised curriculum focused on creating holistic thoughtful, creative, and well-rounded individuals equipped with the key 21st-century skills 'for the development of an enlightened, socially conscious,  knowledgeable, and skilled nation'.

With NEP-2020 in the background, the revised curricula articulate the spirit of the Policy by emphasising upon - an integrated approach to learning; innovative pedagogies and assessment strategies; multidisciplinary and cross-disciplinary education; creative and critical thinking; ethical and Constitutional values through value-based  courses; 21st century capabilities across the range of disciplines through life skills, entrepreneurial and professional skills; community and constructive public engagement; social, moral, and environmental awareness; Organic Living and Global Citizenship Education (GCED); holistic, inquiry-based, discovery-based , discussion-

based and analysis-based learning; exposure to Indian knowledge system, cultural traditions and literature through relevant courses offering "Knowledge of India, fine blend of modern pedagogies with indigenous and traditional ways of learning; flexibility in course choices, student-centric participatory learning; imaginative and flexible curricular structures to enable creative combinations of disciplines for study; offering multiple entry and exit points, alignment of Vocational courses with the International Standard Classification of Occupations maintained by the International Labor Organization; breaking the silos of disciplines; integration of extra-curricular and curricular aspects, exploring internships with local industry, businesses and artists and craft persons; closer collaboration between industry and higher education institutions for technical, vocational, and science programs, and formative assessment tools to be aligned with the learning outcomes, capabilities, and dispositions as specified for each course. The university has also developed a consensus on Blended Learning with 10% component of online teaching and 60% face-to-face classes for each program.

The revised curricula of various programs could be devised with concerted efforts of the faculty, Heads of the Departments, and the Deans of Schools of Study. The draft prepared by each department was discussed in a series of discussion sessions conducted at the Department, School, and University levels. The leadership of the University has been a driving force behind the entire exercise of developing the uniform template and structure for the revised curriculum. The Vice-Chancellor of the University conducted series of meetings with Heads and Deans to deliberate upon the vital parameters of the revised curriculum to formulate a uniform template featuring Background, Programme Outcomes, Programme Specific Outcomes, Postgraduate Attributes, Structure of Masters Course, Learning Outcome Index, Semester-wise Courses and Credit Distribution, Course-level Learning Outcomes, Teaching-Learning Process, Blended Learning, Assessment and Evaluation, Keywords, References, and Appendices. The experts of various Board of Studies and School Boards contributed to a large extent in giving the final shape to the revised curriculum of each program.

To ensure the implementation of curricular reforms envisioned in NEP-2020, the University has decided to implement various provisions in a phased manner. Therefore, the curriculum may be reviewed annually so as to gradually include all relevant provisions of NEP-2020.

## Program Outcomes

On completing Masters in the Faculty of Science, the students shall be able to realize the following outcomes:

| PO | Description |
|----|-------------|
| PO1 | Acquired knowledge with facts and figures related to various subjects in pure sciences such as Physics, Chemistry, Botany, Zoology, Mathematics, etc. |
| PO2 | Understood the basic concepts, fundamental principles, and scientific theories related to various scientific phenomena and their relevance in day-to-day life. |
| PO3 | Acquired the skills in handling scientific instruments, planning, and performing laboratory experiments The skills of observations and drawing logical inferences from the scientific experiments. |
| PO4 | Analyzed the given scientific data critically and systematically and the ability to draw objective conclusions. |

| | |
|---|---|
| PO5 | Been able to think creatively (divergent and convergent) to propose novel ideas in explaining facts and figures or providing new solutions to problems. |
| PO6 | Realized how developments in any science subject help develop other science subjects and vice-versa and how interdisciplinary approach helps provide better solutions and new ideas for sustainable outcomes. |
| PO7 | Developed a scientific outlook concerning science subjects and all aspects related to life. |
| PO8 | Realized that knowledge of subjects in other faculties such as humanities, performing arts, social sciences, etc., can have greatly and effectively influence, which inspires in evolving new scientific theories and inventions. |
| PO9 | Imbibed ethical, moral, and social values in personal and social life, leading to a highly cultured and civilized personality. |
| PO10 | Developed various communication skills such as reading, listening, speaking, etc., which will help express ideas and views clearly and effectively. |
| PO11 | Realized that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude and other necessary qualities leads towards a successful life. |

## Program Specific Outcomes (PSO)

On completing Masters in the M.Sc. in Computer Science Lateral Entry, the students shall be able to realize the following outcomes:

| PSO | Description |
|---|---|
| PSO1 | Communicate computer science concepts, designs, and solutions effectively and professionally |
| PSO2 | Apply knowledge of computing to produce effective designs and solutions for specific problems |
| PSO3 | Use software development tools, software systems, and modern computing platforms |
| PSO4 | To have the knowledge and the ability to develop creative solutions |
| PSO5 | To develop skills to learn new technology |
| PSO6 | To develop critical reasoning |
| PSO7 | To apply computer science theory and software development concepts to construct computing-based solutions |
| PSO8 | To design and develop computer programs/computer-based systems in the area related to algorithms, networking, web design, cloud computing, Artificial Intelligence, Mobile applications |

| PSO9 | The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity |
|---|---|
| PSO10 | The ability to understand the evolutionary changes in computing, apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success, real-world problems, and meet the challenges of the future |
| PSO11 | The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, lifelong learning and a zest for higher studies and also to act as a good citizen by inculcating in them moral values & ethics |

## Postgraduate Attributes

- Disciplinary Knowledge
- Creative & Critical Thinking
- Reasoning and Analytical abilities
- Logic/Discrete Mathematics knowledge
- Logical Thinking
- Problem analysis and solving abilities
- Life Skills
- Moral & Ethical Values
- Research Skills

## Structure of Masters' Programme

**Scheme for**
**M.Sc. Computer Science Lateral Entry (Semester I)**
**Examination 2021**
**Session 2021-22**

| | Course Code | Course Title | Exam Hours | Max. Marks | | Min. Marks | L | T | P* | Credits |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Int. Marks | Ext. Marks | | | | | |
| **Core Courses** | | | | | | | | | | |
| 1 | FS-COMP-MCSLE-CC-101 | Data Structures | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 2 | FS-COMP-MCSLE-CC-102 | Java | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |

| 3 | FS-COMP-MCSLE-CC-103 | a) Software Engineering & Research Methodology<br>b) Artificial Intelligence<br>c) Python<br>d) Theory of Computation | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | FS-COMP-MCSLE-CC-104 | a) Data Analysis Using R<br>b) Introduction to LaTeX | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 5 | FS-COMP-MCS-CP-105 | Combined Practical | 3 | 25 | 75 | 26 (25%) | *combined practical of above subjects | | | |
| **Core Foundation Course** | | | | | | | | | | |
| 1 | FS-COMP-MCS-FC-106 | Computer Fundamentals | 3 | 10 | 40 | 13 (25%) | 4 | 2 | 2 | 5 |

**Scheme for**
**M.Sc. Computer Science (Semester II)**
**Examination 2022**
**Session 2021-22**

| **Semester II** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Course Code** | **Course Title** | **Exam Hours** | **Max. Marks** | | **Min. Marks** | **L** | **T** | **P\*** | **Credits** |
| | | | | **Int. Marks** | **Ext. Marks** | | | | | |
| **Core Courses** | | | | | | | | | | |
| 1 | FS-COMP-MSC-LE-CC-201 | Computer Graphics & Multimedia | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 2 | FS-COMP-MSC-LE-CC-202 | Android Programming | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 3 | FS-COMP-MSC-LE-CC-203 | a) Cloud Computing<br>b) Internet of Things<br>c) Big Data & Data Mining<br>d) Machine Learning | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 4 | FS-COMP-MSC-LE-CC-204 | a) Natural Language Processing<br>b) Introduction to Cyber Security | 3 | 10 | 40 | 13 (25%) | 3 | 1 | 1 | 5 |
| 5 | FS-COMP-MSC-LE-CP-205 | Combined Practical & Project | 3 | 20 | 80 | 13 (25%) | *combined practical of above subjects | | | |
| **Core Foundation Course** | | | | | | | | | | |
| 1 | FS-COMP-MSC-LE-FC-206 | Computer Moral Values | 3 | 10 | 40 | 13 (25%) | 4 | 2 | 2 | 5 |

# M.Sc.(Computer Science) Lateral Entry

## Learning Outcome Index

Learning Outcomes are statements of knowledge, skills, and abilities a student should possess and demonstrate upon completion of learning experiences.

### I.  Programme Outcomes(PO) and Programme Specific Outcomes (PSO)

|       | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | PSO9 | PSO10 | PSO11 |
|-------|------|------|------|------|------|------|------|------|------|-------|-------|
| PO1   | x | x | x | x | x | x | x | x |   | x | x |
| PO2   | x |   | x |   | x | x | x | x | x | x | x |
| PO3   | x | x | x |   | x | x | x | x | x | x | x |
| PO4   | x | x | x | x | x | x |   | x | x | x | x |
| PO5   | x | x | x | x | x | x | x | x | x | x | x |
| PO6   | x | x | x | x | x | x | x |   |   | x | x |
| PO7   |   |   |   | x | x |   | x |   | x | x | x |
| PO8   |   | x |   | x |   | x | x | x |   |   | x |
| PO9   | x | x |   | x | x |   | x | x |   |   | x |
| PO10  | x | x | x |   | x |   |   |   | x |   | x |
| PO11  | x | x | x |   | x | x | x | x | x | x | x |

### II.  Programme Specific Outcomes (PSO) and Core Courses (CC)

|        | MCSLE 101 | MCSLE 102 | MCSLE 201 | MCSLE 202 |
|--------|-----------|-----------|-----------|-----------|
| PSO1   | x | x | x | x |
| PSO2   | x | x | x | x |
| PSO3   | x | x |   | x |
| PSO4   | x | x | x | x |
| PSO5   | x | x | x | x |
| PSO6   |   |   | x |   |
| PSO7   | x | x | x | x |
| PSO8   | x | x |   | x |
| PSO9   | x | x | x | x |
| PSO10  | x | x | x | x |
| PSO11  | x | x | x | x |

### III. Programme Specific Outcomes (PSO) and Core Elective Courses (CEC)

|         | MCSLE 103a | MCSLE 103b | MCSLE 103c | MCSLE 103d | MCSLE 203a | MCSLE 203b | MCSLE 203c | MCSLE 203d |
|---------|------------|------------|------------|------------|------------|------------|------------|------------|
| PSO1    | x | x | x | x | x | x | x | x |
| PSO2    | x | x | x | x | x | x | x | x |
| PSO3    | x |   | x |   | x |   | x |   |
| PSO4    | x | x | x | x | x | x | x | x |
| PSO5    | x | x | x | x | x | x | x | x |
| PSO6    |   | x |   | x |   | x |   | x |
| PSO7    | x | x | x | x | x | x | x | x |
| PSO8    | x |   | x |   | x |   | x |   |
| PSO9    | x | x | x | x | x | x | x | x |
| PSO 10  | x | x | x | x | x | x | x | x |
| PSO 11  | x | x | x | x | x | x | x | x |

### IV. Programme Specific Outcomes (PSO) and Open Elective Courses (OEC)

|  | MCSLE 105a | MCSLE 105b | MCSLE 205a | MCSLE 205b |
|--|------------|------------|------------|------------|

| | | | | |
|------|---|---|---|---|
| PSO1 | X | X | X | X |
| PSO2 | X | X | X | X |
| PSO3 | X | | X | |
| PSO4 | X | X | X | X |
| PSO5 | X | X | X | X |
| PSO6 | | X | | X |
| PSO7 | X | X | X | X |
| PSO8 | X | | X | |
| PSO9 | X | X | X | X |
| PSO 10 | X | X | X | X |
| PSO 11 | X | X | X | X |

## Objectives, Course-level Learning Outcomes, Contents, and Suggested Readings
### Semester I

**Paper Code:** FS-COMP-MCSLE-CC-101
**Paper Name: Data Structures**

**Course Objectives:**
CO1. To Create and initialize variables, constants, arrays, pointers, structures, and unions.
CO2. To Manipulate values of variables, arrays, pointers, structures, unions, and files.
CO3. To Create a function that can receive variables, arrays, pointers, and structures.
CO4. To define functions that can receive variables, arrays, pointers, and structures.
CO5. To create open, read, manipulate, write and close files.
CO6. To select and use appropriate data structures for the given problems.
CO7. To design efficient algorithms using various algorithm designing strategies
CO8. To analyze the problem and develop the algorithms related to these problems
CO9. To classify the problem and apply the appropriate design strategy to develop an algorithm
CO10. To design algorithm in the context of space and time complexity and apply the asymptotic notation
CO11. To be able to analyze algorithms and algorithm correctness.
CO12. To be able to summarize searching and sorting techniques
CO13. To be able to describe stack, queue, and linked list operations.
CO14. To be able to know. tree and graphs concepts

### Learning Outcomes:
After completing this course, students will be able to:
LO1. Create and initialize variables, constants, arrays, pointers, structures, and unions.
LO2. Manipulate values of variables, arrays, pointers, structures, unions, and files.
LO3. Create a function that can receive variables, arrays, pointers, and structures.
LO4. Define functions that can receive variables, arrays, pointers, and structures.
LO5. Create open, read, manipulate, write and close files.
LO6. Select and use appropriate data structures for the given problems.
LO7. Design efficient algorithms using various algorithm designing strategies
LO8. Analyze the problem and develop the algorithms related to these problems
LO9. Classify the problem and apply the appropriate design strategy to develop an algorithm
LO10. Design algorithm in the context of space and time complexity and apply the asymptotic notation
LO11. Ability to analyze algorithms and algorithm correctness.
LO12. Ability to summarize searching and sorting techniques
LO13. Ability to describe stack, queue, and linked list operations.
LO14. Ability to know. tree and graphs concepts

# M.Sc.(Computer Science) Lateral Entry

## Unit I
**Algorithm:** Efficiency & Analysis Algorithm: Time and Space complexity of Algorithm. **Abstract Data Type:** Linked List- Linear, Circular, Two Way List, Basic Operation on Linked Lists, Application of Linked List.

## Unit II
**Stack:** primitive operations, stack Application- Infix, postfix, prefix and Recursion Array, and Linked Representation of Stack. **Queue:** Primitive operation, Circular Queue, Priority Queue, D-queue, Array, and Linked Representation of Queue.

## Unit III
**Trees:** Basic terminology, **Binary Tree**: Representation as Array and link List, Basic operation, **Tree Traversal**: Inorder, Preorder, Postorder, Application of Binary Tree. B-tree, Height Balance Tree (AVL Tree) **Graph:** Basic Terminology, Directed, Undirected, Weighted, Representation of Graphs, **Graph Traversal**: Depth First Traversal, Breadth-First Search.

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### Recommended Readings
1. Expert Data Structure with 'C' By R.B Patel (Khana Book Publishing Co.(P))
2. Data structure By Lipschutz (Tata McGraw Hill)

### Suggested Readings
3. Data Structure By Yashvant Kanitkar (BPB)
4. An Introduction to Data Structures with Applications By Jean-Paul Tremblay, Paul G.Sarerson (Tata McGraw Hill)
5. Data Structure Using C and C++ By Yedidyah Langsam, Moshe J.Augenstein, Arora M. Tenenbaum (Prentice- Hall India)

**Paper Code:** FS-COMP-MCSLE-CC-102

**Paper Name: Java**

**Course Objectives:**
CO1. To use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
CO2. To read and make elementary modifications to Java programs that solve real-world problems.
CO3. To validate input in a Java program.
CO4. To identify and fix defects and common security issues in code.
CO5. To document a Java program using Javadoc.
CO6. To use a version control system to track source code in a project.

**Learning Outcomes:**
After completing this course, students will be able to:
LO1. Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
LO2. Read and make elementary modifications to Java programs that solve real-world problems.
LO3. Validate input in a Java program.
LO4. Identify and fix defects and common security issues in code.
LO5. Document a Java program using Javadoc.
LO6. Use a version control system to track source code in a project.

---

## Unit I
**Introduction to Java:** evolution, features, comparison with C and C++; Java program structure; tokens, keywords, constants, variables, data types, typecasting, statements, Operators and Expression; Conditional Statements and Loop Statements. **Class:** syntax, instance variable, class variables, methods, constructors, overloading.

## Unit II

**Inheritance:** types of inheritance, use of super, method overriding, final class, abstract class, wrapper classes.

Arrays, Strings and Vectors, Packages and Interfaces, visibility controls

## Unit III

**Errors and Exceptions:** Types of errors, Exception classes, Exception handling in java, use of try, catch, finally, throw and throws. Taking user input, Command line arguments.

**Multithreaded Programming:** Creating Threads, the Life cycle of thread, Thread priority, Thread synchronization, Inter-thread communication, Implementing the Runnable Interface.

### Recommended Readings
1. The Complete reference Java Ninth Edition By Herbert Schildt (Tata McGraw Hill)
2. Beginning Programming with Java For Dummies by Burd, For Dummies; 3 edition

### Suggested Readings
3. Java: A Beginner's Guide, Sixth Edition: A Beginner's Guide by Herbert Schildt, McGraw-Hill Osborne MediaProgramming in JAVA By E. Balagurusamy (TMH)
4. JAVA 2 programming Black Book By Steven Holzner et al. (Dreamtech Press)
5. Programming in JAVA By E. Balagurusamy (TMH)

**Paper Code:** FS-COMP-MCSLE-CC-103a

**Paper Name: Software Engineering & Research Methodology**

## Course Objectives:
CO1. To learn the phases of software development
CO2. To develop process models and process systems multiple collections, models
CO3. To gather, understand, analyze and specify requirements
CO4. To develop architectural diagram, and implement by following coding principles
CO5. To apply testing strategies and handle software product maintenance issues
CO6. To get a good knowledge of the issues and challenges faced while doing the Software project Management.
CO7. To understand why the majority of the software projects fail and how that failure probability can be reduced effectively.
CO8. To do the Project Scheduling, tracking, Risk analysis, Quality management, and Project Cost estimation using different techniques.
CO9. To identify and discuss the role and importance of research in the social sciences.
CO10. To identify and discuss the issues and concepts salient to the research process.
CO11. To identify and discuss the complex issues inherent in selecting a research problem, selecting an appropriate research design, and implementing a research project.
CO12. To identify and discuss the concepts and procedures of sampling, data collection, analysis, and reporting.

## Learning Outcomes:
After completing this course, students will be able to:
LO1. Learn the phases of software development
LO2. Develop process models and process systems multiple collections, models
LO3. Gather, understand, analyze and specify requirements
LO4. Develop architectural diagram, and implement by following coding principles
LO5. Apply testing strategies and handle software product maintenance issues
LO6. Get a good knowledge of the issues and challenges faced while doing the Software project Management.
LO7. To understand why the majority of the software projects fail and how that failure probability can be reduced effectively.

LO8. To do the Project Scheduling, tracking, Risk analysis, Quality management, and Project Cost estimation using different techniques.
LO9. Identify and discuss the role and importance of research in the social sciences.
LO10. Identify and discuss the issues and concepts salient to the research process.
LO11. Identify and discuss the complex issues inherent in selecting a research problem, selecting an appropriate research design, and implementing a research project.
LO12. identify and discuss the concepts and procedures of sampling, data collection, analysis, and reporting.

## Unit I

**Software**: Software Characteristics, Software Process, Process Characteristics, **Software Process Model:** Linear Sequential Model, Prototyping Model, Spiral Model, Software Quality, McCall's Quality Factors, **Software Requirement Analysis and Specification (SRS):** Need Characteristics and Components.

## Unit II

**Planning a Software Project:** COCOMO Model, Project Monitoring Plan, and Risk Management. **Design Principle:** Abstraction, Modularity, Cohesion and Coupling, **Software Management**: Size Oriented Metrics, Function Oriented Metrics. **Testing:** Testing Fundamental, Functional Testing (Black Box), Structural Testing (White Box), Alpha And Beta Testing, **Testing Process:** Comparison of Different Testing, Level of Testing.

## Unit III

Research Methodology: Meaning of Research, Objective of Research, Types of Research, Research Approaches, Significance of research, Research Methods versus Methodology, Research Process, Criteria of Good Research, What is Research Problem, Selecting the problem, Necessity of defining the problem, Technique involved in defining a problem.

## Recommended Readings

1. Software Engineering: A Practitioner's Approach By Roger S. Pressman, McGraw Hill.

## Suggested Readings

2. Software Engineering: A Precise Approach by Pankaj Jalote, Wiley Precise textbook Series
3. Research Methodology Methods and Techniques by C. R. Kothari, New Age International Publisher

**Paper Code:** FS-COMP-MCSLE-CC-103b
**Paper Name: Artificial Intelligence**

**Course Objectives:**
CO1. To analyze and formalize the problem as a state space, graph, design heuristics
CO2. To have the ability to represent solutions for various real-life problem domains using logic-based techniques
CO3. To understand the numerous applications and huge possibilities in the field of AI
CO4. To ability to express ideas in AI research and programming language related to emerging technology.

**Learning Outcomes:**
After completing this course, students will be able to:
LO1. To analyze and formalize the problem as a state space, graph, design heuristics
LO2. Ability to represent solutions for various real-life problem domains using logic-based techniques
LO3. Understand the numerous applications and huge possibilities in the field of AI
LO4. Ability to express ideas in AI research and programming language related to emerging technology.

## Unit I

Definition, History, Agents, and environment, Defining the problem as a state and space search, What is Intelligence? Types of Intelligence, Difference between Human and Machine Intelligence, The Structure of Intelligent Agents. Solving problems by searching: Uninformed search strategies- Brute-Force, Breadth-First, Uniform-cost search Depth-First, Depth-limited search,depth-first search, Bidirectional search. Informed (heuristic) search strategies- Greedy best-first search, A*, AO* Memory-bounded heuristic search.

## Unit II

Heuristic functions, local search algorithms- Hill-climbing search, Simulated annealing, Local beam search. Knowledge-Based System: Knowledge, Procedure V/S Declarative Knowledge, Knowledge Representation: Using Procedural and Predicate Logic, Inference in First-order logic: Unification and Lifting, Forward Chaining, Backward Chaining, Resolution. Rule-based System, Frames, Frames, Scripts, and Semantic Nets.

## Unit III

Probabilistic Reasoning, Probability, and Bayes Theorem represent knowledge in the uncertain domain, Certainty factors, Bayesian Networks, Dempster–Shafer theory, introduction to Fuzzy logic. Learning: types of learning, decision trees. **Expert System: types, architecture. Introduction to** Artificial Neural Networks, Reinforcement Learning, Natural Language Processing, Pattern Recognition, and Perception.

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### Recommended Readings
1. Artificial Intelligence By Rich And Knight (Tata McGraw Hill)

### Suggested Readings
2. Introduction to Artificial Intelligence and Expert Systems By Patterson (Prentice-Hall India)
3. Artificial Intelligence A Modern Approach by Russell and Norvig, Prentice Hall

Paper Code:FS-COMP-MCSLE-CC-103c

**Paper Name: Python**

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**Course Objectives:**
CO1. Apply language features including strings, lists, tuples, dictionaries, regular expressions.
CO2. Create and call functions.
CO3. Create and manipulate files.
CO4. Develop classes using OO features.
CO5. Develop internet applications using packages such as urllib.
CO6. To understand why Python is a proper scripting language for developers.
CO7. To learn how to design and program Python applications.
CO8. To learn how to use lists, tuples, and dictionaries in Python programs.
CO9. To learn how to identify Python object types.
CO10.To learn how to use indexing and slicing to access data in Python programs.
CO11. To define the structure and components of a Python program.
CO12. To learn how to write loops and decision statements in Python.
CO13. To learn how to write functions and pass arguments in Python.
CO14. To learn how to build and package Python modules for reusability.
CO15. To learn how to read and write files in Python.
CO16. To learn how to design object☐oriented programs with Python classes.
CO17. To learn how to use class inheritance in Python for reusability.
CO18. To learn how to use exception handling in Python applications for error handling.

**Learning Outcomes:**
After completing this course, students will be able to:
LO1. Apply language features including strings, lists, tuples, dictionaries, regular expressions. LO2. Create and call functions.

LO3. Create and manipulate files.
LO4. Develop classes using OO features.
LO5. Develop internet applications using packages such as urllib.
LO6. To understand why Python is a proper scripting language for developers.
LO7. To learn how to design and program Python applications.
LO8. To learn how to use lists, tuples, and dictionaries in Python programs.
LO9. To learn how to identify Python object types.
LO10.To learn how to use indexing and slicing to access data in Python programs.
LO11. To define the structure and components of a Python program.
LO12. To learn how to write loops and decision statements in Python.
LO13. To learn how to write functions and pass arguments in Python.
LO14. To learn how to build and package Python modules for reusability.
LO15. To learn how to read and write files in Python.
LO16. To learn how to design object☐oriented programs with Python classes.
LO17. To learn how to use class inheritance in Python for reusability.
LO18. To learn how to use exception handling in Python applications for error handling.

## Unit I

Basics: Python Interpreter, writing code in Jupyter Notebook, Indentation, comments, importing a module, binary operators, standard scalar data types, typecasting, if-else statements, loops(while, for), pass, range, ternary expressions. Data Structures and Sequences: Tuples, Lists, and slicing, Built-in Sequence functions, Dictionary, Sets; List, Set, and Dict Comprehensions.

## Unit II

Functions: Namespaces, Scope, and Local Functions; Returning Multiple Values, Anonymous (Lambda) Functions, Partial Argument Application, Generators, Errors, and Exception handling. Basic File Handling. Objects and Methods in Python. NumPy: creating N-dimensional arrays, arithmetic with NumPy arrays, basic indexing, and slicing, Psuedorandom number generation.

## Unit III

Pandas: Overview of Series and DataFrames, reading data from csv file, DataFrame operations-working with data using functions like head, tail , info, shape, reshape, columns, isnull, dropna, mean, sum, describe, value_counts, corr, loc, iloc, apply. Matplotlib- plotting basic figures, subplots, line plots, bar plots, histograms, scatter plots. Overview of Scikit-learn, SciPy, networkx. Applications of python.

### Recommended Readings
1. Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Ipython, by Wes McKinney, O'Reilly Media, 2017Python All-in-One for Dummies, by John Shovic and Alan Simpson, John Wiley & Sons, Inc., 2019

### Suggested Readings
2. Programming in Python 3: A Complete Introduction to the Python Language, Mark Summerfield, Pearson.
3. Swaroop, C. H. (2003). A Byte of Python. Python Tutorial.

4. Introduction to Computation and Programming Using Python. By John V. Guttag, MIT Press.
5. Learning Python,  Mark Lutz, David Ascher, O'Reilly
6. T. Budd, Exploring Python, TMH, 1st Ed, 2011

### Web Resources

1. https://www.learnpython.org/
2. https://nptel.ac.in/courses/106/106/106106212/
3. http://greenteapress.com/thinkpython/thinkpython.pdf
4. Python tutorial: https://docs.python.org/3/tutorial/index.html
7. Python All-in-One for Dummies, by John Shovic and Alan Simpson, John Wiley & Sons, Inc., 2019

**Paper Code:** FS-COMP-MCSLE-CC-103d
**Paper Name: Theory of Computation**

**Course Objectives:**
CO1. able to design Finite Automata machines for given problems;
CO2. able to analyze a given Finite Automata machine and find out its Language;
CO3. able to create Pushdown Automata machine for given CF language(s);
CO4. able to generate the strings/sentences of given context-free languages using its grammar;
CO5. Able to design Turing machines forgivenApplyto identifyInterprettational problem.

**Learning Outcomes:**
After completing this course, students will be able to identify.:
LO1. able to design Finite Automata machines for given problems;
LO2. able to analyze a given Finite Automata machine and find out its Language;
LO3. able to create Pushdown Automata machine for given CF language(s);
LO4. able to generate the strings/sentences of given context-free languages using its grammar;
LO5. Able to design Turing machines forgivenApplyto identifyInterprettational problem.

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### Unit I

Languages: Alphabets, string, language, Basic Operations on language, Concatenation, KleeneStar. Finite Automata and Regular Languages: Regular Expressions, Transition Graphs, Deterministic and non-deterministic finite automata, NFA to DFA Conversion, Regular languages and their relationship with finite automata, Pumping lemma,  and closure properties of regular languages.

### Unit II

Context-free languages: Context-free grammars, parse trees, ambiguities in grammars and languages, Pushdown automata (Deterministic and Non-deterministic), Pumping Lemma, Properties of context-free languages,  normal forms.

### Unit III

Turing Machines and Models of Computations: RAM, Turing Machine as a model of computation, Universal Turing Machine, Language acceptability, decidability, halting problem, Recursively enumerable and recursive languages,  unsolvability problems.

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### Recommended Readings
1. Daniel I.A.Cohen, Introduction to computer theory – John Wiley (1996 2nd Edition).

2. Lewis & Papadimitriou, Elements of the theory of computation – II Edition PHI 1997.

**Suggested Readings**

1. Hopcroft, Aho, Ullman, Introduction to Automata theory, Language & Computation –3rd Edition 2006, Pearson Education.
2. P. Linz, An Introduction to Formal Language and Automata 4th edition Publication Jones Bartlett 2006

**Paper Code:**FS-COMP-MCSLE-CC-105a
**Paper Name: Data Analysis Using R**

**Course Objectives:**
CO1. To use Jupyter Notebook for interactive computation
CO2. To practice Python features such as lists, dictionaries, and files for the given problem
CO3. To use NumPy functions for array processing
CO4. To apply Pandas Dataframe for data wrangling
CO5. To generate graphs for the given data using Matplotlib
CO6. To understand the basics of R programming in terms of constructs, control statements, string Functions.
CO7. To understand the use of R for Data analytics.
CO8. To conduct your independent data analysis.
CO9. To be able to appreciate and apply the R programming from a statistical perspective.

**Learning Outcomes:**
After completing this course, students will be able to:
LO1. Use Jupyter Notebook for interactive computation
LO2. Practice Python features such as lists, dictionaries, and files for the given problem
LO3. Use NumPy functions for array processing
LO4. Apply Pandas Dataframe for data wrangling
LO5. Generate graphs for the given data using Matplotlib
LO6. Understand the basics of R programming in terms of constructs, control statements, string Functions.
LO7. Understand the use of R for Data analytics.
LO8. Conduct your independent data analysis.
LO9. Able to appreciate and apply the R programming from a statistical perspective.

**Unit I**
Foundations for data analysis-matrices, the notion of probability, the concept of random variables and various distributions, mean, variance, covariance, normal distributions, an overview of sampling, hypothesis testing, confidence interval, the concept of optimization.

**Unit II**
installation of R, data editing, use of R as a calculator; functions, and assignments. matrix operations, logical operators, Conditional executions and loops, data management with sequences, repeats, sorting and ordering, lists, vector indexing, factors; display and formatting of strings.

**Unit III**
Working with data frames, Importing data files; Graphics and plots; basic statistical functions for central tendency, variation, box plots, skewness and kurtosis, correlations; overview of using R functions for simple hypothesis testing, Applications of R.

**Recommended Readings**

1. Hands-On Programming with R, Garrett Grolemund, OʹReilly Publishers.
2. R for Beginner - https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf

**Suggested Readings**

3. A Learning Guide to R - https://www.westernsydney.edu.au/__data/assets/pdf_file/0011/830909/Rnotes_20180905_web.pdf
4. Applied Statistics And Probability For Engineers – by Douglas Montgomery, John Wiley & Sons Inc.
5. Research Methodology: Methods And Techniques, C.R. Kothari, New Age International Publishers.
6. Design and Analysis of Experiments (Wiley India), Montgomery, Douglas C.

**Paper Code:** FS-COMP-MCSLE-CC-105b

**Paper Name : LaTeX: a document preparation system**

**Course Objectives:**
CO1. To apply various Excel tools and add-ins for analyzing Business problems.
CO2. To compare mathematical formulas with Spreadsheet formulas
CO3. To explore, query, and summarize business data.
CO4. To apply descriptive statistical measures for business decisions.
CO5. To perform progression analysis and forecasting techniques.
CO6. To understand how to write documents containing mathematical formulas.
CO7. To understand how to write articles in different journal styles.
CO8. To understand how to create PPT in a more presentable manner.
CO9. To understand how to create using built-in templates.

**Learning Outcomes:**
After completing this course, students will be able to:
LO1. Apply various Excel tools and add-ins for analyzing Business problems.
LO2. Compare mathematical formulas with Spreadsheet formulas
LO3. Explore, query, and summarize business data.
LO4. Apply descriptive statistical measures for business decisions.
LO5. Perform progression analysis and forecasting techniques.
LO6. Understand how to write documents containing mathematical formulas.
LO7. Understand how to write articles in different journal styles.
LO8. Understand how to create PPT in a more presentable manner.
LO9. Understand how to create using built-in templates.

## Unit I
Installation of the software LaTeX, Structure of LaTeX documents; Special Characters, Producing equations, Matrices, Tables, itemised lists, hypertext links; Page Layout –Title, Abstract, Chapters, Sections, References.

## Unit II
Including graphics, images, floating bodies; Producing basic mathematical graphics like line segments, arrows, circles, ovals, Generating index and bibliography, creating PDF files.

## Unit III
Adding a new command; generating spaces, colored text; Writing a sample resume, question paper, article/ research paper; Creating a presentation using beamer.
of part A, B and C are 50, 200 and 500 respectively

## Recommended Readings
1. LaTeX: A Document Preparation System, By Leslie Lamport, Addison- Wesley.

## Suggested Readings
2. LaTeX Beginner's Guide, by Stefan Kottwitz, Packt Publishing Limited

3. Tobias Oetiker, Hubert Partl, Irene Hyna, and Elisabeth Schegle: The Not So Short Introduction to LaTeX 2e, https://tobi.oetiker.ch/lshort/lshort-a5book.pdf, 2014.

## Semester IV

**Paper Code:**FS-COMP-MCSLE-CC-201
**Paper Name: Computer Graphics & Multimedia**

**Course Objectives:**
CO1. To develop line and circle generation algorithms
CO2. To apply 2D and 3D transformations
CO3. To develop clipping algorithms for point, line, and polygons
CO4. To learn the concepts of projections, viewing, and graphics pipeline
CO5. To create a simple animation and interaction for multimedia presentation
CO6. To understand image types and color models
CO7. To describe the concepts regarding the digitization of audio signals
CO8. To compress images, videos, and audios using data compression methods
CO9. To encode videos and audios using MPEG
CO10. To ExplainfunctionalIdentify the core concepts of computer graphics, including viewing, projection, perspective, modeling, and transformation in two and three dimensions.
CO11. To apply the concepts of color models, lighting and shading models, textures, ray tracing, hidden surface elimination, anti-aliasing, and rendering.
CO12. To interpret the mathematical foundation of the concepts of computer graphics.
CO13. To describe the fundamentals of animation, parametric curves, and surfaces, and spotlighting.
CO14. To identify a typical graphics pipeline and apply graphics programming techniques to design and create computer graphics.
CO15. To create effective OpenGL programs to solve graphics programming issues, including 3D transformation, object modeling, color modeling, lighting, textures, and ray tracing.
CO16. To understand multimedia concerning any applications, including business, schools, home, education, and virtual reality.
CO17. To understand the hardware and software needed to create projects using creativity and organization to create them.
CO18. To develop multimedia skills to be the principal player of individual multimedia teams in developing projects.
CO19. To work with all aspects of images.
CO20. To work with all aspects of sound.
CO21. To work with all aspects of the video.
CO22. To learn copyright laws associated with multimedia.
CO23. To learn the cost involved in multimedia planning, designing, and producing.
CO24. To learn ways to present their multimedia projects.

**Learning Outcomes:**
After completing this course, students will be able to:
LO1. Develop line and circle generation algorithms
LO2. Apply 2D and 3D transformations
LO3. Develop clipping algorithms for point, line, and polygons
LO4. Learn the concepts of projections, viewing, and graphics pipeline
LO5. Create a simple animation and interaction for multimedia presentation
LO6. Understand image types and color models
LO7. Describe the concepts regarding the digitization of audio signals
LO8. Compress images, videos, and audios using data compression methods
LO9. Encode videos and audios using MPEG
LO10. ExplainfunctionalIdentify the core concepts of computer graphics, including viewing, projection, perspective, modeling, and transformation in two and three dimensions.
LO11. apply the concepts of color models, lighting and shading models, textures, ray tracing, hidden surface elimination, anti-aliasing, and rendering.

LO12. interpret the mathematical foundation of the concepts of computer graphics.

LO13. Describe the fundamentals of animation, parametric curves, and surfaces, and spotlighting.

LO14. Identify a typical graphics pipeline and apply graphics programming techniques to design and create computer graphics.

LO15. Create effective OpenGL programs to solve graphics programming issues, including 3D transformation, object modeling, color modeling, lighting, textures, and ray tracing.

LO16. Students will understand multimedia concerning any applications, including business, schools, home, education, and virtual reality.

LO17. Students will understand the hardware and software needed to create projects using creativity and organization to create them.

LO18. The student will develop multimedia skills to be the principal player of individual multimedia teams in developing projects.

LO19. Students will work with all aspects of images.

LO20. Students will work with all aspects of sound.

LO21. Students will work with all aspects of the video.

LO22. Students will learn copyright laws associated with multimedia.

LO23. Students will learn the cost involved in multimedia planning, designing, and producing.

LO24. Students will learn ways to present their multimedia projects.

## Unit I

Basic elements of Computer Graphics, Graphics display devices, Applications of Computer Graphics, Raster and random scan; Color Models: RGB, CMY, HSV; Graphics Standard: OpenGL; Scan Conversion: DDA line algorithm, Midpoint circle Algorithm. 2D Transformation: Translation, Rotation, Scaling, Homogeneous Coordinates and Matrix Representation of 2D Transformation, Composite Transformation.

## Unit II

3D Graphics: Matrix Representation of 3D transformations, Translation, Rotation, Scaling, Composite Transformation. Overview of concepts: Clipping, orthographic and parallel projection, hidden surface removal, lighting, transparency, modeling and texturing, rendering; Animations: Principles of animations, keyframing, the concept of 2D and 3D animation.

## Unit III

Blender: GUI Interface, Selecting, rotating, and Translating Objects, Using Snap to move objects precisely, Creating mesh primitives and extrusions, Subdividing meshes, Creating a simple creature, Joining mesh objects and stitching vertices, Organizing a scene with layers, groups, and hierarchies, Assigning glossy and reflective materials to objects, Creating bump maps, Creating sky and ambient light, Understanding ambient occlusion, Adding motion blur and depth of field, Editing animation in the Graph Editor, Building and animating a simple character.

### Recommended Readings

1. Computer Graphics (Principles and Practice) by Foley, van Dam, Feiner, and Hughes, Addison Wesley (Indian Edition)
2. Computer Graphics by D Hearn and PM Baker, Prentice Hall of India (Indian Edition).

### Suggested Readings

3. Mathematical Elements for Computer Graphics by DF Roger.
4. Introduction to Computer Graphics By Krishnamurthy N (Tata McGraw Hill
5. Theory and Problems of Computer Graphics (Schaum's Outline) By Zhigang X. and Plastock Ra. (Tata McGraw Hill)

### Web Resources

1. https://www.cs.duke.edu/brd/Teaching/Previous/Animation/animation.html

2. http://zikky.lecturer.pens.ac.id/Produksi 3D untuk Designer/Beginning Blender-book.pdf

3.http://www.blenderhd.com/wp-content/uploads/2015/08/BeginnersGuideToBlender.pdf

4. https://people.sc.fsu.edu/~gerlebacher/gd/blender/blender/blender_noob_to_pro.pdf

5. http://download.blender.org/documentation/pdf/John M Blain - An Introduction To Blender 3D - A Book For Beginners (2011).pdf

6.http://www.cdschools.org/cms/lib04/PA09000075/Centricity/Domain/81/BlenderBasics_4thEdition2011.pdf

7. https://docs.blender.org/manual/en/dev/index.html

Paper Code:FS-COMP-MCSLE-CC-201

**Paper Name: Android Programming**

**Course Objectives:**

CO1. To create an android project from XML Layout.

CO2. To debug Android apps and create UI fragments

CO3. To pass data between fragments

CO4. To design apps with audio playback.

CO5. To create a database and communicate with mobile apps

CO6. To install and configure Android application development toolsCO7. To design and develop user interfaces for the Android platform.

CO8. To save state information across important operating system events.

CO9. To apply Java programming concepts to Android application development.

CO10.  To develop the ability to develop Android Application

**Learning Outcomes:**

After completing this course, students will be able to:

LO1. Create an android project from XML Layout.

LO2. Debug Android apps and create UI fragments

LO3. Pass data between fragments

LO4. Design apps with audio playback.

LO5. Create database and communicate with mobile apps

LO6. Install and configure Android application development tools.

LO7. Design and develop user interfaces for the Android platform.

LO8. Save state information across important operating system events.

LO9. Apply Java programming concepts to Android application development.

LO10.  Develop the ability to develop Android Application

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**Unit -I**

Introduction:  What is Android?, Android Architecture, Setting Android Environment, Android SDK Manager & required Packages, Using Android Studio, Android Virtual Device(AVD), Creating First Android Application, Package Structure, Introduction to Gradle, Running the Application, Views, Layouts and more.

**Unit – II**

Introduction to Views: TextView, EditText View, RadioButton and CheckBox View, Button View, ImageView and ImageButton View, Toast, Notifications.

Introduction to Layouts/ViewGroups: Linear Layout, Relative Layout, Tabular Layout, Hierarchical Layout Arrangements, Adapter, and Adapter View, Using ListView and GridView, SQLite Database.

**Unit – III**

Spinner in Android, Working with Spinners, Margin, and Padding, Working with EditText and TextView, RadioGroup, RadioButton and CheckBox, AutoCompleteTextView in Android, Android Core, and Projects.

Location-Based Services: Sending Email, Sending SMS, Phone Calls

Activity in Android, Intents in Android, Introduction to Fragments, Working with Fragments

## Recommended Readings

Android Programming for Beginners by John Horton Publisher: Packt Publishing

Learn Java for Android Development (2nd edition) by Jeff Friesen Publisher: Apress

## Suggested Readings

Android application development for java programmers. By James C. Sheusi. Publisher: Cengage Learning, 2013.

Beginning Android Programming with Android Studio, Fourth Edition by Jerome F. DiMarzio Publisher: John Wiley & Sons

Android Programming: The Big Nerd Ranch Guide by Kristin Marsicano, Chris Stewart, Bill Phillips Publisher: Big Nerd Ranch Guides

Paper Code:FS-COMP-MCSLE-CC-203a

**Paper Name : Cloud Computing**

**Objective –** After completing this course the student will have an understanding of key aspects of cloud computing

### Unit I

Introduction to Cloud Computing, Services provided by cloud-SaaS, PaaS, IaaS, DaaS etc. Functioning of cloud computing, Advantages, Disadvantages, Applications, Cloud Service Providers- Amazon AWS, Google App Engine, Microsoft, VMware. Virtualization concepts, Objectives, Types of Virtualization & its benefits, Introduction to Various Virtualization OS (Hypervisor). Virtualization for Enterprises

### Unit II

Designing and Implementing a Data Center-Based Cloud, Industry and International Standards for Cloud Implementation, Building private cloud using open source tools, Integration of Public and Private Cloud. Private, Public & Hybrid Clouds, their Advantages & Disadvantages, On-Premises, and Off-Premises Cloud services, installing a Cloud service.

### Unit III

Cloud Security issues - Infrastructure Security, Network level security, Host level security, Application-level security, Data privacy and security Issues, Jurisdictional issues raised by Data location, Access Control, Trust, Reputation, Risk and Authentication in cloud computing

## Recommended Readings

1. Cloud Computing Concepts Technology and Architecture by Thomas Erl, Prentice Hall
2. Cloud Computing Principles and paradigms by Rajkumar Buyya, James Broberg and Andrzej Goscinski, John Wiley and Sons, Inc. Publication
3. Cloud Computing Theory and Practice by Dan C. Marinescu, Morgon Kaufman Publication

**Paper Code:**FS-COMP-MCSLE-CC-203b

**Paper Name: Internet of Things**

**Course Objectives:**

CO1. To understand the definition and significance of the Internet of Things

CO2. To discuss the architecture, operation, and business benefits of an IoT solution

CO3. To examine the potential business opportunities that IoT can uncover

CO4. To explore the relationship between IoT, cloud computing, and big data

CO5. To identify how IoT differs from traditional data collection systems

CO6. To understand the definition and significance of the Internet of Things

CO7. To discuss the architecture, operation, and business benefits of an IoT solution

CO8. To examine the potential business opportunities that IoT can uncover

CO9. To explore the relationship between IoT, cloud computing, and big data

CO10. To identify how IoT differs from traditional data collection systems.

**Learning Outcomes:**

After completing this course, students will be able to:

LO1. Understand the definition and significance of the Internet of Things

LO2. Discuss the architecture, operation, and business benefits of an IoT solution

LO3. Examine the potential business opportunities that IoT can uncover

LO4. Explore the relationship between IoT, cloud computing, and big data

LO5. Identify how IoT differs from traditional data collection systems

LO6. Understand the definition and significance of the Internet of Things

LO7. Discuss the architecture, operation, and business benefits of an IoT solution

LO8. Examine the potential business opportunities that IoT can uncover

LO9. Explore the relationship between IoT, cloud computing, and big data

LO10. Identify how IoT differs from traditional data collection systems.

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## Unit I

M2M to IoT: Introduction, Market Perspective, Architectural Overview. M2M to IoT Technology- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, IoT analytics, Knowledge management, IOT Architecture, Architecture Reference Model, Real-world design constraints.

## Unit II

IoT Use Cases- Asset Management, **Industrial Automation-** Service-oriented architecture-based device integration, SOCRADES: realizing the enterprise integrated Web of Things, IMC-AESOP: from the Web of Things to the Cloud of Things, **Commercial Building Automation-** Introduction, Case study: phase one-commercial building automation today, Case study: phase two- commercial building automation in the future.

## Unit III

Internet of Things Privacy, Security and Governance Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, IoT and Smart Cities, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security

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## Recommended Readings

From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence by Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, 1st Edition, Academic Press, 2014.

1. Internet of Things (A Hands-on-Approach) by Vijay Madisetti and Arshdeep Bahga, 1stEdition, VPT, 2014.

2. Rethinking the Internet of Things: A Scalable Approach to Connecting Everything by Francis daCosta, 1st Edition, Apress Publications, 2013

## Suggested Readings

3. Designing the Internet of Things, Adrian McEwen (Author), Hakim Cassimally

4. Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems by Dr. Ovidiu Vermesan, Dr. Peter Friess, River Publishers

5. Internet of Things (A Hands-on-Approach), Vijay Madisetti, Arshdeep Bahga

6. Building the internet of things with ipv6 and mipv6, The Evolving World of M2M Communications, Daniel Minoli John Wiley & Sons

**Paper Code:**FS-COMP-MCSLE-CC-203c

**Paper Name: Big Data & Data Mining**

**Course Objectives:**

CO1. To explain characteristics and use cases and applications of Big Data

CO2. To develop MapReduce operation using Hadoop

CO3. To be able to understand the role of Virtualization Technologies

CO4. To design and implement systems for data mining.

CO5. To evaluate the performance of different data-mining algorithms.

CO6. To propose data-mining solutions for various applications.

**Learning Outcomes:**

After completing this course, students will be able to:

LO1. Explain characteristics and use cases and applications of Big Data

LO2. Develop MapReduce operation using Hadoop

LO3. Ability to understand the role of Virtualization Technologies

LO4.design and implement systems for data mining.

LO5. Evaluate the performance of different data-mining algorithms.

LO6. Propose data-mining solutions for various applications.

## Unit I

Data mining Introduction: Definition, Data mining tasks, Data mining as a step of the Knowledge discovery process, Applications of Data mining; Data objects and types of attributes, Recalling mean, median, mode, and weighted arithmetic mean, Data quality, an overview of data preprocessing.

## Unit II

Classification analysis- definition, Overview of various classification techniques; Decision tree induction- working, examples, specifying attribute test conditions,  Measures of node impurity, measures for selecting best split; Evaluating the performance of a classifier- Holdout method, Random subsampling, cross-validation, Bootstrap.

## Unit III

Association analysis: support, confidence, association rules, Frequent Itemsets; Frequent itemset generation - Apriori principle, Apriori algorithm, and examples,  FP growth algorithm and examples;  Closed and maximal frequent itemsets. Cluster analysis: Definition, an overview of basic clustering methods, Density-based methods-DBSCAN.

## Recommended Readings

1. Data Mining: Concepts and Techniques, 3rd edition, Jiawei Han and Micheline Kamber

2. Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pearson Education.

## Suggested Readings

3. Data Mining: A Tutorial Based Primer, Richard Roiger, Michael Geatz, Pearson Education 2003.

4. Introduction to Data Mining with Case Studies, G.K. Gupta, PHI 2006

5. Insight into Data mining: Theory and Practice, Soman K. P., DiwakarShyam, Ajay V., PHI 2006

6. Data Mining:: Practical Machine Learning Tools and Techniques (Morgan Kaufmann Series in Data Management Systems) by Witten, Frank, Hall

**Paper Code:**FS-COMP-MCSLE-CC-203d

**Paper Name: Machine Learning**

# M.Sc.(Computer Science) Lateral Entry

**Course Objectives:**
CO1. To be able to design Finite Automata machines for given problems;
CO2. To be able to analyze a given Finite Automata machine and find out its Language;
CO3. To be able to create Pushdown Automata machine for given CF language(s);
CO4. To be able to generate the strings/sentences of given context-free languages using its grammar;
CO5. To be able to design Turing machines forgivenApplyto identifyInterprettational problem.

**Learning Outcomes:**
After completing this course, students will be able to-
LO1. Able to design Finite Automata machines for given problems;
LO2. Able to analyze a given Finite Automata machine and find out its Language;
LO3. Able to create Pushdown Automata machine for given CF language(s);
LO4. Able to generate the strings/sentences of given context-free languages using its grammar;
LO5. Able to design Turing machines forgivenApplyto identifyInterprettational problem.

## Unit I

Introduction: Concept of Machine Learning, Applications of Machine Learning, Key elements of Machine Learning, Supervised vs. Unsupervised Learning, Statistical Learning: Bayesian Method, The Naive Bayes Classifier. Tools for Machine Learning and Linear Algebra Overview: Plotting of Data, Vectorization, Matrices, and Vectors: Addition, Multiplication, Transpose and Inverse using available tools/libraries with Python.

## Unit II

Linear Regression: Prediction using Linear Regression, Gradient Descent, Linear Regression with one variable, Linear Regression with multiple variables, Polynomial Regression, Feature Scaling/Selection. Logistic Regression: Classification using Logistic Regression, Logistic Regression vs. Linear Regression, Logistic Regression with one variable and with multiple variables.

## Unit III

Regularization: Regularization and its utility: The problem of Overfitting, Application of Regularization in Linear and Logistic Regression, Regularization and Bias/Variance. Neural Networks: Introduction, Model Representation, Gradient Descent vs. Perceptron Training, Stochastic Gradient Descent, Multilayer Perceptrons, Multiclass Representation, Backpropagation Algorithm.

## Recommended Readings

1. Tom M. Mitchell, "Machine Learning", First Edition by Tata McGraw-Hill Education, 2013
2. Ethem Alpaydin, "Introduction to Machine Learning" 2nd Edition, The MIT Press, 2009
3. Christopher M. Bishop, "Pattern Recognition and Machine Learning" by Springer, 2007
4. Mevin P. Murphy, "Machine Learning: A Probabilistic Perspective" by The MIT Press, 2012

## Suggested Readings

1. Machine Learning For Dummies, John Paul Mueller, Luca Massaron,For Dummies; 1st edition
2. Machine Learning for Absolute Beginners: A Plain English Introduction, O Theobald, Scatterplot Press; 2nd edition
3. Introduction to Machine Learning with Python: A Guide for Data Scientists, Andreas C. Müller, Sarah Guido,O′Reilly; 1st edition
4. https://www.cmpe.boun.edu.tr/~ethem/i2ml3e/

**Paper Code:**FS-COMP-MCSLE-CC-205a

**Paper Name: Natural Language Processing**

**Course Objectives:**

CO1. To have an introduction of the fundamental concepts and techniques of natural language processing (NLP).

CO2. To gain an in-depth understanding of the computational properties of natural languages and the commonly used algorithms for processing linguistic information.

CO3. To examine NLP models and algorithms using both the traditional symbolic and the more recent statistical approaches.

CO4. To understand critical concepts from NLP are used to describe and analyze language.

CO5. To perform POS tagging and context-free grammar for the English language.

CO6. To understanding semantics and pragmatics of English language for processing·

CO7. To write programs in Python to carry out natural language processing

**Learning Outcomes:**

After completing this course, students will be able to-

LO1. Introduction to the fundamental concepts and techniques of natural language processing (NLP).

LO2. Students will gain an in-depth understanding of the computational properties of natural languages and the commonly used algorithms for processing linguistic information.

LO3. The course examines NLP models and algorithms using both the traditional symbolic and the more recent statistical approaches.

LO4. Critical concepts from NLP are used to describe and analyze language.

LO5. POS tagging and context-free grammar for the English language.

LO6. Understanding semantics and pragmatics of English language for processing·

LO7. Writing programs in Python to carry out natural language processing

## Unit I

Introduction, Basics of text processing, Spelling Correction: Edit Distance; N-Gram Language Models, Evaluation of Language Models, Basic Smoothing, Computational Morphology, Introduction to POS Tagging, Overview of Hidden Markov Model, Basics of Models for Sequential tagging – Introduction to Maximum entropy and Conditional Random Fields.

## Unit II

Constituency syntax parsing, examples of parsing using CKY and PCFG, Introduction to Dependency Grammars and Parsing, understanding of Transition Based Parsing; Distributional Semantics - Introduction, Applications; Word Embedding: Frequency-based embedding, Prediction based embeddings. Lexical Semantics: an overview of WordNet, Word Sense Disambiguation.

# M.Sc.(Computer Science) Lateral Entry

## Unit III

Topic models: introduction, LDA; Introduction to Entity Linking and Information Extraction; Text Summarization: an overview of various approaches; Text Classification: introduction and simple practical implementation using Python. Sentiment Analysis: Concept, Analysis, and Applications.

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### Recommended Readings
1. Natural Language Understanding, Pearson Education; 2nd edition, James Allen
2. Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition, 2e, Jurafsky / Martin.
3. Handbook of Natural Language Processing, Nitin Indurkhya, Fred J. Damerau, Taylor and Francis; Second edition
4. The Handbook of Computational Linguistics and Natural Language Processing, Alexander Clark, Chris Fox, Shalom Lappin, Wiley-Blackwell; 1st edition
5. Natural Language Processing with Python: Analysing Text with the Natural Language Toolkit, Steven Bird, Ewan Klein, Edward Loper, Shroff pub.
6. Foundations of Statistical Natural Language Processing, Christopher D. Manning, Hinrich Schütze, MIT press.

### Suggested Readings
1. Statistical Methods for Speech Recognition (Language, Speech, and Communication) Fourth Printing Edition, by Frederick Jelin
2. Neural Network Methods for Natural Language Processing Synthesis Lectures on Human Language Technologies, Yoav Goldberg, Graeme Hirst, Morgan and Claypool Life Sciences.

**Paper Code:** FS-COMP-MCSLE-CC-205b

**Paper Name: Introduction to Cyber Security**

**Course Objectives:**
CO1. To identify and classify various attacks
CO2. To encrypt and decrypt messages using block chippers and signs.
CO3. To create a digital signature using multiple algorithms.
CO4. To describe web security, intruders, viruses, and firewalls

**Learning Outcomes:**
After completing this course, students will be able to-
LO1. Identify and classify various attacks
LO2. Encrypt and decrypt messages using block chippers and signs.
LO3. Create a digital signature using multiple algorithms.
LO4. Describe web security, intruders, viruses, and firewalls

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## Unit I

Basics: Linux/Mac Terminal and Commands, Basic Computer Terminology, Computer Security models, Computer Security Terms, Computer Ethics, Business, and Professional Ethics, Need for cyber security; Cyber Frauds and crimes, Digital Payments, Various Search Engines, Introduction to Auditing, Deep Web, VAPT, Smartphone Operating systems, introduction to compliances, Globalization and borderless world.

# M.Sc.(Computer Science) Lateral Entry

## Unit II

Basic Python Scripting: Python Basics, Variables and Types, Lists, Basic Operators, String Formatting, Basic String Operations, Conditions, Loops, Functions, Classes and Objects, Dictionaries, Modules, and Packages.

## Unit III

Cyber Laws: Need for Cyber Regulations; Scope and Significance of Cyber laws: Information Technology Act 2000; Network and Network Security, Access and Unauthorised Access, Data Security, E Contracts and E Forms. Penal Provisions for Phishing, Spam, Virus, Worms, Malware, Hacking, Trespass, and Stalking; Human rights in cyberspace, International Co-operation in investigating cybercrimes.

**Recommended Readings**
1. Behrouz A. Forouzan (2004). Data communication and Networking. Tata McGraw-Hill.
2. Kurose, James F. & Ross, Keith W. (2003). Computer Networking: A Top-Down Approach Featuring the Internet (3rd Ed.). Pearson Education.
3. Langtangen, H.P. (2012). Python Scripting for Computational Science (4th Ed.). Springer
4. Craig, B. (2012). Cyber Law: The Law of the Internet and Information Technology. Pearson. Sharma J. P. & Kanojia S. (2016). Cyber Laws. New Delhi: Ane Books Pvt Ltd.
5. Paintal, D. Law of Information Technology. New Delhi: Taxmann Publications Pvt. Ltd

**Suggested Readings**
1. Shema, M. (2012). Hacking Web Apps: Detecting and Preventing Web Application Security Problems.
2. https://uou.ac.in/sites/default/files/slm/Introduction-cyber-security.pdf
3. Computer Programming And Cyber Security for Beginners: This Book Includes: Python Machine Learning, SQL, Linux, Hacking with Kali Linux, Ethical Hacking. Coding and Cybersecurity Fundamentals, Zach Codings, Independently published

**Paper Code:** FS-COMP-MCSLE-CC-205c
**Paper Name: Combined Practical & Project/Dissertation/Industrial Training**

**Course Objectives:**
CO1. Identify and define the problem statement
CO2. Define and justify the scope of the proposed problem
CO3. Gather and analyze system requirements
CO4. Propose an optimized solution among the existing solutions
CO5. Practice software analysis and design techniques
CO6. Develop technical report writing and oral presentation skills
CO7. Develop a functional application based on the software design
CO8. Apply to code, debugging, and testing tools to enhance the quality of the software
CO9. Prepare the proper documentation of software projects following the standard guidelines
CO10. Become a master in specialized technology
CO11. Become updated with all the latest changes in the technological world.
CO12. Ability to communicate efficiently.
CO13. Ability to be a multi-skilled engineer with sound technical knowledge, management, leadership, and entrepreneurship skills.
CO14. Capability and enthusiasm for self-improvement through continuous professional development and life-long learning
CO15. Awareness of the social, cultural, global, and environmental responsibility of an engineer.

**Learning Outcomes**

After completing this course, students will be able to:

LO1. Identify and define the problem statement

LO2. Define and justify the scope of the proposed problem

LO3. Gather and analyze system requirements

LO4. Propose an optimized solution among the existing solutions

LO5. Practice software analysis and design techniques

LO6. Develop technical report writing and oral presentation skills

LO7. Develop a functional application based on the software design

LO8. Apply to code, debugging, and testing tools to enhance the quality of the software

LO9. Prepare the proper documentation of software projects following the standard guidelines

L10. Become a master in specialized technology

LO11. Become updated with all the latest changes in the technological world.

LO12. Ability to communicate efficiently.

LO13. Ability to be a multi-skilled engineer with sound technical knowledge, management, leadership, and entrepreneurship skills.

LO14. Capability and enthusiasm for self-improvement through continuous professional development and life-long learning

LO15. Awareness of the social, cultural, global, and environmental responsibility of an engineer.

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**Practical Training and Project Work:**

1. Project Work may be done individually or in groups in case of bigger projects. However, if the project is done in groups, each student must be given responsibility for a distinct module and care should be taken to monitor the individual student.

2. Project Work can be carried out in the college or outside with prior permission of the college.

3. The Student must submit a synopsis of the project report to the college for approval. The Project Guide can accept the project or suggest modification for resubmission. Only on acceptance of the draft project report, the student should make the final copies.

**Submission Copy:**

The Student should submit a spiral-bound copy of the project report.

**Format of the Project:**

1. **Paper:**
   The Report shall be typed on White Paper of A4 size.

2. **Final Submission:**
   The Report to be submitted must be original.

3. **Typing:**
   **Font:**- Times New Roman
   **Heading:-** 16 pt., Bold
   **Subheading:-** 14 pt, Bold
   **Content:-** 12 pt.
   **Line Spacing:-** 1.5 lines.
   **Typing Side:-**One Side
   **Font Color:-** Black.

4. **Margins:**
   The typing must be done in the following margin:
   **Left**: 0.75"
   **Right**: 0.75"
   **Top**: 1"
   **Bottom**: 1"
   **Left Gutter:** 0.5"

5. **Binding:**
   The report shall be Spiral Bound.
6. **Title Cover:**
   The Title cover should contain the following details:
   **Top:** Project Title in block capitals of 16pt.
   **Centre:** Name of project developer's and Guide name.
   **Bottom:** Name of the university, Year of submission all in block capitals of 14pt letters on separate lines with proper spacing and centering.
7. **Blank sheets:**
   At the beginning and end of the report, two white blank papers should be provided, one for the Purpose of Binding and the other to be left blank.
8. **Content:**
   I). Acknowledgment
   II). Institute/College/Organization certificate where the project is being developed.
   III). Table of contents
   IV). A brief overview of the project
   V). Profiles of problems assigned
   VI). Study of Existing System
   VII). System Requirement
   VIII). Project plan
   - o Team Structure
   - o Development Schedule
   - o Programming language and Development Tools
     IX). Requirement Specification
     X). Design
   - o Detailed DFD and Structure Diagram
   - o The data structure, Database, and File Specification
   XI). Project Legacy
   - Current Status of project
   - Remaining Areas of concern
   - Technical and Managerial Lessons Learnt
   - Future Recommendations
   - o Nomenclature and Abbreviations.
   - o Bibliography
   - o Source Code

## Teaching-Learning Process

The teaching-learning process may include the following-
- Lectures
- Discussions
- Simulations
- Virtual Labs
- Role-Playing
- Participative Learning
- Interactive Sessions
- Seminars
- Research-based Learning/ Dissertation/ Case Study/ Project Work

The Blended Learning mode of teaching and learning is preferable in which offline (face-to-face) and online learning both are used to provide learners the opportunity to enjoy both of the worlds. Teachers can share instructions, lecture notes, and assignments online. On the other hand,

students can share information/work/assignments with teachers and other students directly in a collaborative setting. This may have a more enriched learning experience, and collaboration between students can be improved upon if group activities rely on information gathered from online resources or lessons. Students who complete online coursework followed by interactive, face-to-face class activities have richer educational experiences.

## Assessment and Evaluation

1. **ELIGIBILITY FOR ADMISSION**
   PGDCA from the MGS University and affiliated colleges under the jurisdiction of the university shall be eligible for admission to the M.Sc.(CS) LE Course. (Relaxation to SC/ST etc. as per State Government/University Admission Rules)

2. **PASS CRITERIA**
   For passing in the examination, a candidate is required to obtain at least a Satisfactory Grade in each paper (Internal + External) and also acquire a Satisfactory Grade in theory and practical separately (in each semester examination).

3. **INSTRUCTIONS TO PAPER SETTER**
   The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit). **Section-B** will consist of 9 questions (3 questions from each unit). **Section C** will consist of 6 questions (2 questions from each unit).
   The word limit of parts A, B, and C are 50, 200, and 500 respectively

1. **INSTRUCTIONS FOR PRACTICAL EXAMINATION**
   Marks Distribution for Practical Exam -
   1. Each practical exam is to be conducted by two examiners one External and one Internal. The external examiner should be a senior lecturer from the jurisdiction of other universities. Credit Weightage distribution for external practical of 4 credits is as under
      a) Practical Examination exercise of 3 questions        2 credits
      b) Viva-Voce                                           1 credit
      c) Laboratory Exercise File                            1 credit
   2. Marks distribution for External Project report of 40 marks is as under
      a. External Evaluation-
         i. Research Project/ Case Study    2 credits
         ii. Presentation                   1 credit
         iii. External Viva Voce            1 credit
      b. Internal Evaluation- Dissertation    1 credit

2. **INSTRUCTIONS FOR STUDENTS**
   - The student has to complete two months of career-oriented summer training from any firm/organization. If the student does not get a chance to go for training, he/she can choose a research topic and can complete the dissertation under the supervision of any of the faculty in his college.
   - The student who has to opt for training has to provide a signed certificate from the firm/ organization authority stating that the student has spent two months as a trainee in his organization/firm. The student who has opted for a dissertation has to submit his/her dissertation report with a certificate from his supervisor.
- In both cases, the student has to present his work in front of all the faculty members and fellow students at the starting of the next session.
  - In terms of credits, every one-hour session of L amounts to 1 credit per semester and a minimum of two-hour sessions of T or P amounts to 1 credit per semester.

**\* An Academic/ Industrial Tour shall be organized by the college/department in every session. A Tour Report shall be prepared and submitted by the students after a study tour to industries/academic institutions of repute.**

- A comprehensive and continuous evaluation by mid-semester examinations at regular intervals to find out each course level learning outcome
- Formative assessment on the basis of activities of a learner throughout the program instead of one assessment. for this provision of internal exams, student seminars, and assignments is included
- Open book exam is suggested for internal/ mid-term exams to better facilitate the understanding of the knowledge required
- Group examinations are recommended on problem-solving exercises and in major projects to enhance the teamwork capabilities of the learner
- Collaborative/Individual assignments are useful to enhance the capability of learners to gain domain-specific knowledge
- Student Seminars and Quizzes are recommended for the continuous learning and evaluation process

### Evaluation

Internal Assessment -  Midterm Examination  10%
Term paper  10%
Students Participation  5%
External Assessment-  75%

### Examination Paper Pattern

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit). **Section-C** will consist of 6 questions (2 questions from each unit). The word limit of parts A, B, and C are 50, 200, and 500 respectively

## Key Features of Revised Curriculum

Following are the key features of the revised curriculum-
- Student Centric Teaching and Learning approach
- Technology oriented approach of teaching
- Hand-on Practical/ Laboratory Sessions
- Problem-oriented teaching and learning
- Problem-analysis oriented assignments and evaluation
- Enhance logical thinking and analytical capabilities

## Appendices

List of Open Electives offered by the University -

**Post Graduate Diploma in Computer Application**

<span style="color:red">**EXAMINATION 2022**</span>

# M. G. S. UNIVERISTY, BIKANER

# SYLLABUS

# SCHEME OF EXAMINATION AND

# COURSES OF STUDY

**FACULTY OF COMPUTER SCIENCE**

**PGDCA – 2022**



Maharaja Ganga Singh University

Bikaner

<p style="text-align:center; color:red"><strong>EXAMINATION 2022</strong></p>

**SCHEME OF EXAMINATION**

1. **ELIGIBILITY FOR ADMISSION**

   Graduates of any statutory university shall be eligible for admission to the PGDCA Course. (Eligibility Marks/ Relaxation to SC/ST etc.  as per Government/University Rules)

2. **PASS CRITERIA**

   The examinee has to secure at least 36% marks to pass the examination and 25% marks in each individual paper. Even if he/she will be failed in one paper/course, he/she will be declared fail. She/he however should be allowed one more chance to take the examination as Ex-student. In such a case, the marks of practical/ tutorials etc shall be carried forward for the said purpose.

3. **CLASSIFICATION OF SUCCESSFUL CANDIDATE**

   | **Division** | **Total Marks** |
   | --- | --- |
   | First Division | 60% and above |
   | Second Division | Above 48% and below 60% |
   | Pass | Above 36% and below 48% |
   | Fail | Below 36% |

4. **INSTRUCTIONS TO PAPER SETTER**

   The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus).The word limit of part A, B and C are 50, 200 and 500 respectively

5. **WORKLOAD**

   At least 3 classes for theory class and 3 classes for practical lab should be assigned per week for each paper.

6. **INSTRUCTIONS FOT PRACTICAL EXAMINATION**

   Marks Distribution for Practical Exam -

   Each practical exam is to be conducted by two examiners one External and one Internal. External examiner should be senior lecturer from jurisdiction of MGS University. External examiner will prepare question paper of Practical Examination. Students have to perform exercise on computer. Exercise must be written in answer books in proper documentation.

   Marks distribution for Practical of 50 marks is as under

   | | |
   | --- | --- |
   | i) Three Exercise of 10 marks each | 30 Marks |
   | (Logic 04, Execution 03, Documentation 03) | |
   | ii) Viva-Voce | 10 Marks |
   | iii) Laboratory Exercise File | 10 marks |

   Marks distribution for Project of 100 marks is as under

   | | |
   | --- | --- |
   | i) Project Dissertation and Presentation | 75 marks |
   | ii) External Viva Voce | 25 marks |

   Teaching and Examination scheme

## Post Graduate Diploma in Computer Application

| Paper | Paper Name(Theory) | Lect/ week | Tuto/ week | Exam Hours | Max. Marks | Min. Pass. Marks |
|---|---|---|---|---|---|---|
| **Theory Papers** | | | | | | |
| PGDCA-101 | Computer Organization | 3 | 1 | 3 | 50 | **13** (25%) |
| PGDCA-102 | Programming with C++ | 3 | 1 | 3 | 50 | **13** (25%) |
| PGDCA-103 | Database System | 3 | 1 | 3 | 50 | **13** (25%) |
| PGDCA-104 | Operating System | 3 | 1 | 3 | 50 | **13** (25%) |
| PGDCA-105 | Computer Networks | 3 | 1 | 3 | 50 | **13** (25%) |
| **Total of Theory Papers** | | | | | **250** | **90** (36% aggregate) |
| **Paper Name (Practical)** | | | | | | |
| PGDCA-106 | Research Project/ Case Study | 3 | 1 | 3 | 100 | **25** (25%) |
| PGDCA107 | C++ Lab | 3 | | 3 | 50 | **13** (25%) |
| PGDCA 108 | DBMS Lab | 3 | | 3 | 50 | **13** (25%) |
| **Total of Practical Papers** | | | | | **200** | **72** (36% aggregate) |
| **Grand Total (Theory 250 + Practical 200)** | | | | | **450** | **162** (36% aggregate) |

**Paper Code: PGDCA-101**

**Paper Name : Computer Organization**

### Scheme of Examination

Maximum Marks: 50                                     Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

3

### Unit I

**Components of a Computer:** Processor, Memory, Input-Output Unit, Difference between Organization and Architecture, Hardware Software Interaction. **Number System:** Concept of Bit and Byte, types and conversion. **Complements:** 1's complement, 2's complement. **Binary Arithmetic:** Addition, overflow, subtraction, multiplication (booth's algorithm) and division algorithm.

### Unit II

**Logic gates:** Boolean Algebra, Map Simplification. **Combinational circuits**: Half Adder, Full Adder, Decoders, Multiplexers. **Sequential circuits:** Flip Flops- SR, JK, D, T Flip-Flop.

### Unit III

**Input Output Organization:** Peripheral devices, I/O Interface, Asynchronous Data Transfer, Modes of Data Transfer, Direct Memory Access, I/O Processor.

### Unit IV

**Memory Organization:** Types and capacity of Memory, Memory Hierarchy, Cache Memory, Virtual Memory.

### Unit V

**Intel 8085 Microprocessor:** Introduction, ALU, Timing and Control Unit, Register Set, Data and Address Bus, Addressing modes, Complete Intel 8085 Instruction set, Instruction format, Opcode and Operand, Word Size, Intel 8085 programs.

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### Suggested Readings

1. Computer System Architecture, By M. Morris Mano (Pearson, Prentice Hall)

2. Carter Nicholas, "Computer Architecture", Schaun outline Sevies, Tata McGraw-Hill.

3. J.P. Hayes, "Computer Architecture & Organization", Tata McGraw Hill

4. Digital Computer Fundamentals By Thomas C. Batree (McGraw Hill)

5. Microprocessor Architecture, Programming, and Application With the 8085 By Ramesh Gaonkar (PENRAM)

6. Fundamentals of Microprocessor and Microcomputes By B.Ram (Danpat Rai Publications)

**Paper Code: PGDCA-102**

**Paper Name : Programming with C++**

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### Scheme of Examination

Maximum Marks: 50                                                    Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

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### Unit I

Object Oriented System**:** Difference Between Procedural and Object Oriented Languages, Object Oriented Paradigm, Inheritance, Polymorphism, Abstraction, Encapsulation, Benefits and Application of Oops. Introduction to C++: Character Set, Token, Constants, Variables and Data Types, Enumeration Types, Operators, Expressions, Operator Precedence and Associatively, Input, Output, Conditional Statements, Scope of Variables, Type Conversion.

### Unit II

Iteration, Break, Continue, goto; Pointers**:** Introduction, implementation advantage and disadvantage**.** Functions **-** Standard and User-Defined Function, Recursive Function, Passing By Value And Reference, Function Overloading.

### Unit III

Array**:** introduction, advantage, One, Two and Multidimensional, String Processing. Class: Introduction to Class and Object, Declaring Members and Methods in a class, declaring objects.

### Unit IV

Functions and objects, Inline Function, Friend Functions and Its Usage, Abstract Class, Function Overriding. Constructor and Destructor**-** Needs and Its Usage, Types of Constructors, Destructor, Static Data Members and Methods. Inheritance - Need of Inheritance, Types of Inheritance and its implementation.

### Unit V

Operator Overloading: Need and Rules of Operator Overloading, Overloading Through Member Function and Friend Function. Compile Time and Run Time Polymorphism- Virtual Function and virtual class. Additional Features of C++11, C++14 and C++17.

### Suggested Readings

1. Object Oriented Programming With C++ By E. Balagurusamy (Tata Mcgraw Hill)

2. C++ The Complete Reference By Herbert Sehildt (Tata Mcgraw Hill)

3. Object Oriented Programming With C++ By Schaum Series (Tata Mcgraw Hill)

4. C++11 for Programmers (Deitel Developer) by Paul J. Deitel (Author), Harvey M. Deitel, Prentice Hall; 2nd edition

5. Professional C++ by Marc Gregoire, Nicholas A. Solter and Scott J.Kleper (Goodreads Publications)

6. A Tour of C++ by Bjarne Stroustrup, 2018

7. C++17 in Detail by Bartłomiej Filipek

**Paper Code: PGDCA-103**

**Paper Name : Database Management**

### Scheme of Examination

Maximum Marks: 50                                                                 Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

### Unit I

Introduction: Characteristics of database approach, Advantages, Database system architecture, Overview of different types of Data Models and data independence, Schemas and instances, Database languages and interfaces; E-R Model : Entities, Attributes,keys, Relationships, Roles, Dependencies, E-R Diagram.

### Unit II

Introduction to Relational model, Constraints: Domain ,Key, Entity integrity, Referential integrity; Keys: Primary, Super, Candidate, Foreign; Relational algebra: select, project, union, intersection, minus, cross product, different types of join , division operations; aggregate functions and grouping.

### Unit III

SQL: Data Types, statements: select, insert, update,delete, create, alter, drop; views, SQL algebraic operations, nested queries; Stored procedures: Advantages, Variables, creating and calling procedures, if and case statements, loops, Cursors, Functions, Triggers.

### Unit IV

Normalization: Definition, Functional dependencies and inference rules, 1NF, 2NF, 3NF and BCNF; Transactions processing: Definition , desirable properties of transactions, serial and non-serial schedules ,concept of serializability , conflict-serializable schedules.

### Unit V

Concurrency Control: Two-phase locking techniques, dealing with Deadlock and starvation, deadlock prevention protocols, basic timestamp ordering algorithm; Overview of database recovery techniques;concept of data warehousing.

### Suggested Readings

1. Fundamentals of Database Systems,Ramez A. Elmasri, Shamkant Navathe,5$^{th}$ Ed(Pearson)

2. Database System Concepts By Korth, Silberschatz, Sudarshan (Mcgraw Hill)

3. An Introduction to Database Systems By Bipin C. Desai (Galgotia Publication.)

4. SQL, PL/SQL Programming By Ivan Bayross (BPB)

5. Commercial Application Development Using Oracle Developer 2000 By Ivan Bayross (BPB)

6. http://www.mysqltutorial.org/mysql-stored-procedure-tutorial.aspx

**Paper Code: PGDCA-104**

**Paper Name : Operating System**

### Scheme of Examination

Maximum Marks: 50                                             Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

### Unit I

Introduction to Operating System, layered Structure, Functions, Types; Process: Concept, Process States, PCB; Threads, System calls; Process Scheduling: types of schedulers, context switch.

### Unit II

CPU Scheduling, Pre-Emptive Scheduling, Scheduling Criteria- CPU Utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling Algorithms- FCFS, SJF, Priority Scheduling, Round Robin Scheduling, MLQ Scheduling, MLQ With Feedback.

### Unit III

Synchronization: Critical Section Problem, Requirements for a solution to the critical section problem; Semaphores,simple solution to Readers-Writers Problem. Deadlock: Characterization, Prevention, Avoidance, Banker's Algorithm, Recovery from Deadlock.

### Unit IV

Memory Management: Physical and virtual address space, Paging, Overview of Segmentation;Virtual Memory Management: Concept,Page Replacement techniques- FIFO, LRU, Optimal. Linux: features of Linux, steps of Installation, Shell and kernel, Directory structure.

# Post Graduate Diploma in Computer Application

**Unit V**

Linux: Users and groups,file permissions, commands- ls, cat, cd, pwd, chmod, mkdir, rm, rmdir, mv, cp, man, apt, cal, uname, history etc. ; Installing packages; Shell scripts: writing and executing a shell script,shell variables, read and expr, decision making (if else), for and while loops.

## Suggested Readings

1. Operating System Principals By Abraham Silberschatz, Peter Baer Galvin (John Wiley And Sons Inc.)

2. Operating System Concepts And Design By Milan Milen Kovic (Tata Mcgraw Hill)

3. Modern Operating System Andrew S. Tanenbaum, Herbert Bos
4. Linux in easy steps, Mike McGrath, in easy steps limited
5. Unix concepts and apllications , TMH, Sumitabha Das

**Paper Code: PGDCA-105**

**Paper Name : Computer Networks**

## Scheme of Examination

Maximum Marks: 50                                                        Duration: 3 Hours

Minimum Passing Marks: 13

The question paper contains 3 sections. **Section-A** consists of 10 questions (2 questions from each unit of syllabus). **Section-B** consists of 10 questions (2 questions from each unit of syllabus). **Section-C** consists of 5 questions (1 question from each unit syllabus). The word limit of part A, B and C are 50, 200 and 500 respectively.

## Unit - I

**Data Communication and Networking:** Overview, Network Types, LAN Technologies, Topologies, Models- OSI Model, TCP/IP Stack, Security

## Unit - II

**Physical Layer:** Introduction, Impariments,Performance, Digital Transmission, modes, digital to digital, analog to digital, Analog Transmission, digital to analog, analog to analog, Transmission media, Wireless Transmission, **Switching techniques:** Circuit Switching, Packet switching, Message switching.

## Unit - III

**Data Link Layer:** Introduction, Data Link Control: Line Discipline- Enq/Ack, Poll/Select, **Flow Control** : Stop And Wait, Sliding Window, **Error Control :** ARQ, Stop and Wait ARQ, Sliding Window ARQ.

## Unit - IV

**Network Layer:** Introduction, Network Addressing, Routing, Internetworking, Tunneling, Packet Fragmentation, Network Layer Protocols, ARP, ICMP, IPv4, IPv6

## Unit V

**Transport Layer:** Introduction, Function, End to end communication, Transmission Control Protocol, User Datagram Protocol

**Application Layer:** Introduction, Client-Server Model, Application Protocols, Network Services

## Suggested Readings

1. Data Communication and Networking By Forozan (Tata McGraw Hill)

2. Data Communication And Computer Networks By Dr. Madhulika Jain, Satish Jain (BPB)

3. William Stallings, "Data and Computer Communications", Pearson Education, 2008.

4. Rajneesh Agrawal and Bharat Bhushan Tiwari, "Data Communication and Computer

Networks", Vikas Publishing house Ltd. , 2005.

5.  A. S. Tanenbaum, "Computer Networks", Fourth Edition, Pearson Education.

**Paper Code: PGDCA-106**

**Paper Name : Project**

## Scheme of Examination

Maximum Marks: 50                                                    Duration: 3 Hours

Minimum Passing Marks: 13

Marks distribution for Project of 100 marks is as under-

| | |
|---|---|
| i) Project Dissertation and Presentation | 75 marks |
| ii) External Viva Voce | 25 marks |

**Practical Training and Project Work:**

1.  Project Work may be done individually or in groups in case of bigger projects(maximum two). However if project is done in group each student must be given a responsibility for a distinct module and care should be taken to monitor the individual student.

2.  Project Work can be carried out in the college or outside with prior permission of college.

3.  The Student must submit a synopsis of the project report to the college for approval. The Project Guide can accept the project or suggest modification for resubmission. Only on acceptance of draft project report the student should make the final copies.

4.  **Project report should be hand written**

**Submission Copy:**

The Student should submit Spiral bound copy of the project report.
**Format of the Project:**

(a)  **Paper:**
    The Report shall be typed on White Paper of A4 size.

(b)  **Final Submission:**
    The Report to be submitted must be original.

(c)  **Typing:**
    **Font:-** Times New Roman
    **Heading:-** 16 pt., Bold
    **Subheading:-** 14 pt, Bold
    **Content:-** 12 pt.
    **Line Spacing:-** 1.5 line.
    **Typing Side :-**One Side
    **Font Color:-** Black.

(d)  **Margins:**
    The typing must be done in the following margin:
    **Left** : 0.75"
    **Right**: 0.75"
    **Top**: 1"
    **Bottom**: 1"
    **Left Gutter:** 0.5"

(e)  **Binding:**
    The report shall be Spiral Bound.

(f)  **Title Cover:**
    The Title  cover should contain the following details:
    **Top:** Project Title in block capitals of 16pt.

**Centre:** Name of project developer's and Guide name.
**Bottom:** Name of the university, Year of submission all in block capitals of 14pt letters on separate lines with proper spacing and centering.

(g) **Blank sheets:**
At the beginning and end of the report, two white blank papers should be provided, one for the Purpose of Binding and other to be left blank.

(h) **Content:**

I).   Acknowledgement

II).  Institute/College/Organization certificate where the project is being developed.

III). Table of contents

IV).  A brief overview of project

V).   Profiles of problem assigned

VI).  Study of Existing System

VII). System Requirement

VIII). Project plan

- o Team Structure
- o Development Schedule
- o Programming language and Development Tools

IX).  Requirement Specification

X).   Design

- o Detailed DFD's and Structure Diagram
- o Data structure, Database and File Specification

XI).  Project Legacy

- o Current Status of project
- o Remaining Areas of concern
- o Technical and Managerial Lessons Learnt
- o Future Recommendations

XII).  Nomenclature and Abbreviations.

XIII). Bibliography

XIV).  Source Code.

**M.Sc. Computer Sc. (Cyber Security)**
**Session 2020-21**
**Examination 2021-22**

**ELIGIBILITY FOR ADMISSION**
Graduates possessing 50% marks in any faculty of any statutory university who have studied Computer Science/ Computer Application as a main or vocational subject for three years shall be eligible for admission to the M.Sc. Cyber Security Course (Relaxation to SC/ST etc. as per Prevailing Rules)

**PASS CRITERIA**
For passing in the examination, a candidate is required to obtain at least 25% in each paper (Internal + External) and 36% marks in the total aggregate in theory and 36% marks in practical separately (in each semester examination).

**CLASSIFICATION OF SUCCESSFUL CANDIDATES**
          As per university norms

**Scheme of Examination**
1.  English shall be the medium of instructions and examination.
2.  Examinations shall be conducted at the end of course as per the Academic Calendar notified by the Maharaja Ganga Singh University of Bikaner.
    *Instructions for Paper setters*
3.  The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).
4.  The word limit of part A, B and C are 50, 200 and 500 respectively
4.1 The duration of written examination for each paper shall be of three hours and Practical examination shall be for 3 hours duration.
4.2 The minimum attendance required by a candidate will be as per university rules.
5.  With regard to dissertation/project/training, the scheme of evaluation shall be as follows:
5.1.1   The candidate has to submit a dissertation in a bound form in three copies at the end of course which would be evaluated by an external examiner.  Total marks for dissertation shall be 50 (40 external + 10 internal marks).
5.1.2   The dissertation/case study/project/training/review will be evaluated at the end of course by an external examiner.
5.1.3   Students are advised to complete dissertation/project/training (Review or experimental) preferably in some outside research institute or industry or otherwise in the University.
6.  An educational tour may be organized for students within or outside the State under the supervision of faculty members of the department. Traveling expenses of the teacher/s will be borne by the university as per rules.

## Teaching and Examination scheme for
## M.Sc. Cyber Security
## Semester I

| Paper Code | Paper Name | Exam Hours | Maximum Marks | | Minimum passing Marks |
|---|---|---|---|---|---|
| | | | Internal Marks | External Marks | |
| MCSEC 101 | Mathematical Foundations for Cyber Security | 3 | 10 | 40 | 13 |
| MCSEC 102 | Cyber Crime, Cyber Laws and IPR | 3 | 10 | 40 | 13 |
| MCSEC 103 | Computer Networks | 3 | 10 | 40 | 13 |
| MCSEC 104 | C++ and Data Structures | 3 | 10 | 40 | 13 |
| MCSEC 105 | Combined Practical | 3 | 25 | 75 | 36 |
| Grand Total(Theory+ Practical) | | | 300 | | |

## Teaching and Examination scheme for
## M.Sc. Cyber Security
## Semester II

| Paper Code | Paper Name | Exam Hours | Maximum Marks | | Minimum passing Marks |
|---|---|---|---|---|---|
| | | | Internal | External | |
| MCSEC 201 | Information Security and Cryptography | 3 | 10 | 40 | 13 |
| MCSEC 202 | Ethical Hacking | 3 | 10 | 40 | 13 |
| MCSEC 203 | DBMS | 3 | 10 | 40 | 13 |
| MCSEC 204 | Python | 3 | 10 | 40 | 13 |
| MCSEC 205 | Combined Practical | 3 | 25 | 75 | 36 |
| Grand Total(Theory+ Practical) | | | 300 | | |

## Teaching and Examination scheme for
## M.Sc. Cyber Security
## Semester III

| Paper Code | Paper Name | Exam Hours | Maximum Marks | | Minimum passing Marks |
|---|---|---|---|---|---|
| | | | Internal | External | |
| MCSEC 301 | Cyber Forensics, Audit and Investigation | 3 | 10 | 40 | 13 |
| MCSEC 302 | Biometric Security | 3 | 10 | 40 | 13 |
| MCSEC 303 | Wireless LAN and Mobile Computing | 3 | 10 | 40 | 13 |

| MCSEC 304 | Operating Systems | 3 | 10 | 40 | 13 |
|-----------|-------------------|---|----|----|----|
| MCSEC 305 | Combined Practical | 3 | 25 | 75 | 36 |
| Grand Total(Theory+ Practical) | | | | 300 | |

## Teaching and Examination scheme for
## M.Sc. Cyber Security
## Semester IV

| Paper Code | Paper Name | Exam Hours | Maximum Marks | | Minimum Passing Marks |
|------------|------------|------------|--------------|----------|------------------------|
| | | | Internal | External | |
| MCSEC 401 | Malware Analysis | 3 | 10 | 40 | 13 |
| MCSEC 402 | Mobile and wireless security | 3 | 10 | 40 | 13 |
| MCSEC 403 | Intrusion Detection and Prevention Systems | 3 | 10 | 40 | 13 |
| MCSEC 404 | Project/Dissertation | 3 | 10 | 40 | 13 |
| MCSEC 405 | Combined Practical | 3 | 25 | 75 | 36 |
| Grand Total(Theory+ Practical) | | | | 300 | |

<u>**Note:**</u>
*Instructions for Paper setters*
1. The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).
2. Each practical exam is to be conducted by two examiners one External and one Internal. External examiner should be senior lecturer from jurisdiction of other universities. Marks distribution for Practical of 40 marks is as under
   a) Practical Examination exercise of 3 questions     30 marks
   b) Viva-Voce     5 marks
   c) Laboratory Exercise File     5 marks
3. Marks distribution for Project of 40 marks is as under
   a. External Evaluation-
      i. Project Dissertation     30 marks
      ii. Presentation     5 marks
      iii. External Viva Voce     5 marks
   b. Internal Evaluation- Dissertation     10 marks
4. The student has to complete two months career oriented summer training from any firm/organization. If the student does not get a chance to go for training, he/she can choose a research topic and can complete dissertation under the supervision of any of the faculty in his college.
5. The student who has opted training, has to provide a signed certificate from the firm/ organization authority stating that the student has spent two months as a trainee in his organization/firm. The student who has opted for dissertation, has to submit his/her dissertation report with a certificate from his supervisor.
6. In both the cases a student has to present his work in front of all the faculty members and fellow students at the starting of the next session.
7. At least 3 hours for lectures and one hour for tutorial should be allotted per week for each theory paper.
8. A slot of at least 2 hours per week should be allotted for each practical paper.

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

**MCSEC-101 Mathematical Foundations for Cyber Security**

*Instructions for Paper setters*
The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

**Note:** Scientific Calculator may be allowed in the examination.

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### Unit I

Overview of Sets, Basics of counting, Permutations and Combinations, Relations-equivalence and partial orders. Concept of time complexity and asymptotic notations . **Graph Theory**: Euler graphs, Hamiltonian paths and circuits, planar graphs, rooted and binary trees, cut sets, graph colorings and applications, chromatic number, chromatic partitioning and polynomial, matching.

### Unit II

**Analytic Number Theory**: Prime numbers, Euclid's lemma, Euclidean algorithm, basic properties of congruences, residue classes and complete residue systems, Euler-Fermat theorem, Lagrange's theorem and its applications, Chinese remainder theorem, primitive roots. Algebra: groups, cyclic groups, rings, fields, finite fields, lattices and their applications to cryptography.

### Unit III

**Linear Algebra**: vector spaces and subspaces, linear independence, basis and dimensions, linear transformations and applications. **Probability theory**: basics, conditional probability, Bayes theorem, random variables – discrete and continuous, normal probability distribution, central limit theorem, stochastic process, Markov chain. **Coding Theory**:  equivalence of codes, linear codes. Overview of Pseudorandom Number Generation.

**Suggested Readings:**

1. Discrete Mathematics and its applications by K. H. Rosen, seventh edition, TMH
2. Ivan Niven, Herbert S. Zuckerman, and Hugh L. Montgomery, 'An introduction to the theory of numbers', John Wiley and Sons 2004.
3. Douglas Stinson, 'Cryptography – Theory and Practice', CRC Press, 2006.
4. Sheldon M Ross, "Introduction to Probability Models", Academic Press, 2003.
5. H. Anton, "Elementary Linear Algebra", John Wiley & Sons, 2010.
6. C.L. Liu, 'Elements of Discrete mathematics', McGraw Hill, 2008.
7. Fraleigh J. B., 'A first course in abstract algebra', Narosa, 1990.
8. Joseph A. Gallian, ''Contemporary Abstract Algebra', Narosa, 1998.
9. D.S. Malik, J. Mordeson, M.K.Sen, Fundamentals of abstract algebra,TataMcGrawHill

## MCSEC-102 Cyber Crime, Cyber Laws and IPR
### *Instructions for Paper setters*

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

### Unit I

Introduction to cyber crime and cyber law, cyberspace and information technology, Nature and scope of cyber crime, Jurisdiction of cybercrime. Important definitions under IT Act 2000, Cyber crime issues: unauthorized access, White collar crimes, viruses, malwares, worms, Trojans, logic bomb, Cyberstalking, voyeurism, obscenity in internet, Software piracy

### Unit II

IT Act 2000, offences under IT Act and IT(amendment) Act, 2008. CRPC overview, Role Of Intermediaries, Electronic Evidence, Cyberterrorism, espionage, warfare and protection system. Overview of amended laws by the IT Act, 2000: The Indian Penal Code, 1860, The Reserve Bank of India Act 1934, Cyber Theft and the Indian Telegraph Act,1885. Digital Signatures and certificate-legal issues.

### Unit III

Intellectual Property rights: Introduction to IP, Copyright, Related Rights, Trademarks, Geographical Indications, Industrial Design, Patents, Licensing and transfer of technology, WIPO Treaties , CopyrightsAct, PatentsAct, Trademark Act.

**Suggested Readings:**

1. Cyber Security, Cyber Crime and Cyber Forensics: Applications and Perspectives, Raghu Santanam, M. Sethumadhavan, Information Science Reference.
2. Pfleeger, Charles P.and ShariL. Pfleeger.Security in Computing, 4th Edition. Upper Saddle River, NJ:Prentice Hall,2008.
3. Cyber crime:Security and Surveillance in the Information Age,Douglas Thomas; Brian Loader.
4. Computer Crime:A Crime-Fighters Handbook by David Icove.
5. Crime in the Digital Age: Controlling Telecommunications and Cyber space Illegalities,Peter N. Grabosky.
6. Cyber law–The Indian Perspective By Pavan Duggal,Saakshar Law Publications.
7. Jonathan Rosenoer,"Cyber Law:The law of the Internet", Springer-Verlag, 1997.
8. Mark F Grady,Fransesco Parisi,"The Law and Economics of Cyber Security",Cambridge University Press,2006.

Duration: 3 Hours                                                            Maximum Marks: 50

## MCSEC-103  Computer Networks

### *Instructions for Paper setters*

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

### Unit I

Introductory Concepts: Goals and Applications of Networks, Network structure and architecture, the OSI reference model, services, networks topology.  Physical  Layer: The Physical Layer, Theoretical Basis for Data Communication, Guided Transmission Media, Wireless Transmission, Overview of Digital Signal Encoding Formats, Digital Modulation – ASK, FSK, PSK, PSK, Digitization – Sampling Theorem, PCM, DM, Analog  Modulation  – Introducing AM, FM, PM,  The Mobile Telephone System.

### Unit II

The Data Link Layer: Data Link Layer Design Issues, Error Detection and Correlation, Flow Control Protocols, Stop-and-wait Flow Control, Sliding – Window Flow Control, Error Control, Stop-and-wait ARQ, Go-back-N; Example of Data Link Protocols-HDLC Medium access sub layer: Channel allocations, ALOHA Protocols, Carrier Sense Multiple Access Protocols, Ethernet, wireless LANs, BlueTooth, Data Link Layer Switching.

### Unit III

Network Layer: Point-to-Point network, routing algorithms, congestion control, internetworking, Quality Control, Internetworking, The Network Layer in the Internet, IP packet, IP addresses, IPv6. Transport Layer: Design Issue, connection management, TCP window management, User Datagram Protocol, Transmission Control Protocol, Performance Issues. Application Layer: DNS,          E-Mail, WWW,          Multimedia, application layer protocols.

**Suggested Readings**

1. Forouzan, "Data Communication and Networking", TMH, 4th Edition.

2. A.S. Tanenbaum, "Computer Networks", PHI, 4th Edition.

3. W. Stallings, "Data and Computer Communication", Macmillan Press.

4. Comer, "Computer Networks and Internet", PHI.   5.Comer, "Internetworking with TCP/IP", PHI.
5. W. Stallings, "Data and Computer Communication", McMillan.

Duration: 3 Hours
Maximum Marks: 50
Minimum Passing Marks: 13

## MCSEC-104 C++ and Data Structures

### *Instructions for Paper setters*

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

## Unit I

**Basics** : Overview of OOPs, if-else statements, loops (for, while). **Functions** : Overview, passing arguments by value and reference, recursive function, pointers. **Arrays**: Overview, array and function, array and pointers. **Class**: Overview, static data members, Inline Function, Constructors and Destructors.

## Unit II

**Inheritance:** usage, types, compile time and run time polymorphism, overloading and overriding, virtual function, friend function, abstract class. String handling, String class, Overview of Templates. **Searching**: Linear Search, Binary Search. **Sorting:** Insertion Sort, Quick sort.

## Unit III

**Algorithm:** Time and Space complexity of Algorithm. **Overview and applications of abstract data types:** Linked List, Stack, Queue. **Trees :** Basic terminologies. **Binary Tree** : Representation as Array, Basic operations, **Tree Traversal** : Inorder, Preorder, Postorder, Application of Binary Tree.

## Suggested Readings

1. Object Oriented Programming With C++ By E. Balagurusamy (Tata Mcgraw Hill)
2. C++ The Complete Reference By Herbert Schildt (Tata Mcgraw Hill)
3. Object Oriented Programming With C++ By Schaum Series (Tata Mcgraw Hill)
4. C++11 for Programmers (Deitel Developer) by Paul J. Deitel (Author), Harvey M. Deitel, Prentice Hall; 2nd edition
5. Professional C++ by Marc Gregoire, Nicholas A. Solter and Scott J.Kleper (Goodreads Publications)
6. A Tour of C++ by Bjarne Stroustrup, 2018
7. C++17 in Detail by Bartłomiej Filipek
8. Expert Data Structure with 'C' By R.B Patel (Khana Book Publishing Co.(P))
9. Data structure By Lipschutz (Tata McGraw Hill)
10. Data Structure By Yashvant Kanitkar (BPB)
11. An Introduction to Data Structures with Applications By Jean-Paul Tremblay, Paul G.Sarerson (Tata McGraw Hill)

12. Data Structure Using C and C++ By Yedidyah  Langsam, Moshe J.Augenstein, Arora M. Tenenbaum (Prentice- Hall  India)

Duration: 3 Hours                                   Maximum Marks: 50
                                                    Minimum Passing Marks: 13

## MCSEC-201 Information Security and Cryptography

### *Instructions for Paper setters*

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

## Unit I

**Information Security**: Introduction, CNSS Security Model, Components of Information System, Approaches to Information Security Implementation, The Security Systems Development Life Cycle. **Cryptography**: Concept, traditional ciphers like Caesar, Substitution, Vigenere, Transposition.

## Unit II

**Symmetric key Ciphers**: Concept and Types, Structure and analysis of DES, Security of DES, Structure and analysis of AES. **Asymmetric key Ciphers**: Concept of public key cryptosystems, RSA algorithm, Diffie-Hellman Key exchange. **Message Authentication and Hash Functions:** Authentication requirements and functions, MAC and Hash Functions.

## Unit III

**MAC Algorithms**: Secure Hash Algorithm, Digital signatures, Kerberos. Concept and applications of IPSec, SSL, TLS, SET, PGP and S/MIME. Concept of steganography. **Cryptanalysis:** Concept, Linear Cryptanalysis, Differential Cryptanalysis.

**Suggested Readings:**

1. Principles of Information Security : Michael E. Whitman, Herbert J. Mattord, CENGAGE Learning, 4th Edition.
2. Cryptography and Network Security : William Stallings, Pearson Education, 4th Edition.
3. Cryptography and Network Security : Forouzan Mukhopadhyay, McGraw Hill, 2nd Edition.

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

## MCSEC-202 Ethical Hacking

### *Instructions for Paper setters*

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

### Section I

Introducing Hacking, Different types of hacking, Phases of hacking, Installation and configuration of Kali Linux, Overview of directory structure, Usage of basic commands; Malwares – Virus , Worms, Trojan; Information gathering using NMAP and ZenMAP .

### Section II

Metasploit: Exploiting System Software and Privilege, Metasploit Social Engineering Attack. Working and Network analysis with Wireshark , Network and web scanning about target , Packet captures and man-in-the-Middle attacks. Hacking using different social Engineering techniques.

### Section III

DoS and DDoS attacks, Hardware hacking, Hijack sessions, Hacking web servers, Website Hacking , SQL Injection and SQLMAP, Database assessment , Router and Wi-Fi attacks, different types of password attacks, phishing attacks.

**Suggested Readings:**

1. Basic Security Testing with Kali Linux, by Daniel Dieterle, freely available online.

2. Gray Hat Hacking The Ethical Hacker's Handbook, Branko Spasojevic, TMH, 2018.

2. Ethical Hacking and Penetration Testing Guide, by Rafay Baloch , Auerbach Publications.

3. Kali Linux Revealed,by Raphaël Hertzog, JimO'Gorman, and Mati Aharoni, offsec press,https://kali.training/downloads/Kali-Linux-Revealed-1st-edition.pdf

5. Kali Linux - An Ethical Hacker's Cookbook, by Himanshu Sharma , Packt Publishing Limited

**Web resources:**

1. https://nptel.ac.in/courses/106/105/106105217/

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

**MCSEC-203  DBMS**

## *Instructions for Paper setters*

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

## Unit I

**Introduction**: Characteristics of database approach, Advantages, Database system architecture, Overview of different types of Data Models and data independence, Schemas and instances, Database languages and interfaces; **E-R Model** : Entities, Attributes,keys, Relationships, Roles, Dependencies, E-R Diagram; Normalization: Definition, Functional dependencies and inference rules, 1NF, 2NF, 3NF and BCNF.

## Unit II

**Introduction to Relational model**, Constraints: Domain, Key, Entity integrity, Referential integrity; Keys: Primary, Super, Candidate, Foreign; **Relational algebra**: select, project, union, intersection, minus, cross product, different types of join , division operations; aggregate functions and grouping**; SQL**: Data Types, statements: select, insert, update,delete, create, alter, drop; views, SQL algebraic operations, nested queries; Stored procedures: Advantages, Variables, creating and calling procedures, if and case statements, loops, Cursors, Functions, Triggers.

## Unit III

**Transactions processing**: Definition , desirable properties of transactions, serial and non-serial schedules ,concept of serializability , conflict-serializable schedules; **Concurrency Control:** Two-phase locking techniques, dealing with Deadlock and starvation, deadlock prevention protocols, basic timestamp ordering algorithm; Overview of database recovery techniques; concept of data warehousing.

**Suggested Readings:**

1. Fundamentals of Database Systems,Ramez A. Elmasri, Shamkant Navathe,5th Ed(Pearson)

2. Database System Concepts By Korth, Silberschatz, Sudarshan (Mcgraw Hill)

3. An Introduction to Database Systems By Bipin C. Desai (Galgotia Publication.)

4. SQL, PL/SQL Programming By Ivan Bayross (BPB)

5. Commercial Application Development Using Oracle Developer 2000 By Ivan Bayross (BPB)

## Web Resources

1. http://www.mysqltutorial.org/mysql-stored-procedure-tutorial.aspx

Duration: 3 Hours                                          Maximum Marks: 50
                                                          Minimum Passing Marks: 13

**MCSEC-204 Python**

*Instructions for Paper setters*

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

## Unit I

Basics: Python Interpreter, writing code in Jupyter Notebook, Indentation, comments, importing a module, binary operators, standard scalar data types, type casting, if-else statements, loops(while, for), pass, range, ternary expressions. Data Structures and Sequences: Tuples, Lists and slicing, Built-in Sequence functions, Dictionary, Sets; List, Set, and Dict Comprehensions.

## Unit II

Functions: Namespaces, Scope, and Local Functions; Returning Multiple Values, Anonymous (Lambda) Functions, Partial Argument Application, Generators, Errors and Exception handling. Basic File Handling. Objects and Methods in Python. NumPy: creating N-dimensional arrays, arithmetic with NumPy arrays, basic indexing and slicing, Psuedorandom number generation.

## Unit III

Pandas: Overview of Series and DataFrames, reading data from csv file, DataFrame operations- working with data using functions like head, tail , info, shape, reshape, columns, isnull, dropna, mean, sum, describe, value_counts, corr, loc, iloc, apply. Matplotlib- plotting basic figures, subplots, line plots, bar plots, histograms, scatter plots. Overview of Scikit-learn, SciPy, networkx. Applications of python.

### Suggested Readings:

1. Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Ipython, by Wes McKinney, O'Reilly Media, 2017
2. Python All-in-One for Dummies, by John Shovic and Alan Simpson, John Wiley & Sons, Inc., 2019
3. Programming in Python 3: A Complete Introduction to the Python Language, Mark Summerfield, Pearson.
4. Swaroop, C. H. (2003). A Byte of Python. Python Tutorial.
5. Introduction to Computation and Programming Using Python. By John V. Guttag, MIT Press.
6. Learning Python , Mark Lutz, David Ascher, O'Reilly
7. T. Budd, Exploring Python, TMH, 1st Ed, 2011

**Web Resources**

1. https://www.learnpython.org/
2. https://nptel.ac.in/courses/106/106/106106212/
3. http://greenteapress.com/thinkpython/thinkpython.pdf
4. Python tutorial: https://docs.python.org/3/tutorial/index.html

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

**MCSEC-301 Cyber Forensics, Audit and Investigation**

*Instructions for Paper setters*

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

### Unit I

Filesystem: CHS, LBA, HPA, write blockers, Extracting & recovering partitions, MBR, DOS partition table, Extended partition table, RAID; NTFS file system:Architecture, File creation,File deletion, Compression, encryption and indexing; Extended file systems: EXT4, Architecture, File creation, File deletion and Journaling; Other Disk structures; Windows and Linux boot process;File system acquisition and recovery.

### Unit II

Windows Forensic Analysis: Window artifacts, Evidence volatility,System time, Logged on user(s), Open files, MRUs, Network information, Process information, Service information, Windows Registry, Startup tasks, Memory dumping; Document Forensics:PDF structure,PDF analysis, MS Office Document structure and analysis, Macros, Windows thumbnails.

### Unit III

Mobile Forensics: SIM Card, Android architecture, Android File System, Android application; Virtual Machines, Network Forensics; Cyber crime investigation: Pre investigation,SOP for Investigation; Case scenarios:social media crime, Email investigation; CDR Analysis. Auditing: Internal Audit and IT Audit Function, IT Governance, Frameworks, Standards, and Regulations, Identifying information assets, Risk assessment and management.

**Suggested Readings:**

1. Computer Evidence-Collection and Preservation. Brown,C.L.T. Course Technology Cengage Learning.
2. Guide to Computer Forensics And Investigations Nelson, Bill; Phillips, Amelia; Enfinger,Frank;Steuat,Christopher Thomson Course Technology.
3. Computer Forensics–Computer Crime Scene Investigation. Vacca, John R. Charles River Media
4. Bunting, Steveand William Wei.EnCase Computer Forensics:The Official EnCE: EnCase Certified Examiner Study Guide.Sybex, 2006
5. Incident Response: Computer Forensics, Prosise, Chris, Kevin Mandia, and Matt Pepe, McGraw-Hill,2014
6. IT Security Risk Control Management:An Audit Preparation Plan,Raymond Pompon,Apress 2016
7. Carrier, Brian.File System Forensic Analysis. Addison- Wesley Professional.

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

**MCSEC-302 Biometric Security**

*Instructions for Paper setters*

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

## Unit I

Biometrics: Introduction, benefits of biometrics over traditional authentication systems, benefits of biometrics in identification systems, selecting a biometric for a system, Applications, Key biometric terms and processes, biometric matching methods, Accuracy in biometric systems.

## Unit II

Physiological Biometric Technologies: Fingerprints- characteristics, strengths and weaknesses; Facial scan- characteristics, strengths and weaknesses; Iris scan- characteristics, strengths and weaknesses; Retina vascular pattern- characteristics, strengths and weaknesses; Hand scan - characteristics, strengths and weaknesses; DNA biometrics.

## Unit III

Behavioral Biometric Technologies: Handprint Biometrics, overview of DNA Biometrics. Signature and handwriting technology- description, classification, keyboard/keystroke dynamics; Voice- data acquisition, feature extraction, characteristics, strengths and weaknesses. Multi biometrics and multi factor biometrics.

**Suggested Readings:**

1. Samir Nanavathi, Michel Thieme, and Raj Nanavathi : "Biometrics -Identity verification in a network", 1st Edition, Wiley Eastern, 2002.
2. John Chirillo and Scott Blaul :"Implementing Biometric Security", 1st Edition, Wiley Eastern Publication, 2005.
3. John Berger: "Biometrics for Network Security", 1st Edition, Prentice Hall, 2004.
4. Paul Reid, Biometrics for network security, Hand book of Pearson, 2004

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

## MCSEC-303 Wireless LAN and Mobile Computing

### *Instructions for Paper setters*

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

### Unit I

Wireless Networks: Introduction, Architecture, Wireless SwitchingTechnology, Wireless Communication problem, Wireless Network Reference Model, Wireless, Wireless LAN: Infrared vs radio transmission, Infrastructure and Ad-hoc Network, IEEE 802.11:System Architecture,Protocol Architecture, 802.11b, 802.11a, Bluetooth: User Scenarios, Architecture.

### Unit II

Global System for Mobile Communications (GSM): Mobile Services, SystemArchitecture, Protocols, Localization & Calling, Handover, Security. GPRS: GPRS System, Architecture, UMTS: UMTS System Architecture. LTE: Long Term Evolution. MobileComputing: Mobilecommunication, Mobilecomputing, Mobile Computing Architecture, Mobile Devices, Mobile System Networks, Mobility Management;

### Unit III

Mobile Network Layer: Mobile IP: Goals, Assumptions, Entities and Terminology, IP Packet Delivery, Agent Discovery, Registration, Tunneling and Encapsulation, Optimizations, DHCP. Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP, TCP over 2.5G/3G Wireless Networks.

**Suggested Readings:**

1. Schiller, J. 2008. Mobile Communications. 2nd ed. India: Pearson Education.
2. Kumar,S. and Kakkasageri, M.S. "Wireless and Mobile Networks: Concepts and Protocols", Wiley India.
3.Kamal R. 2011. "Mobile Computing", 2ndEd.Oxford University Press.
4. Talukder, A. K., Ahmed, H. andYavagal,R.R. 2010.Mobile Computing: Technology, Applications and Service Creation, 2ndEd. Tata McGraw Hill
5.Gast, M.S. "802.11 Wireless Networks: The Definitive Guide", O'Reilly Media.

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

## MCSEC-304 Operating Systems

### Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

### Unit I

Introduction to Operating System, layered Structure, Functions, Types; Process: Concept, Process States, PCB; Threads, System calls; Process Scheduling: types of schedulers, context switch, CPU Scheduling, Pre-Emptive Scheduling, Scheduling Criteria- CPU Utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling Algorithms- FCFS, SJF, Priority Scheduling, Round Robin Scheduling, MLQ Scheduling, MLQ With Feedback.

### Unit II

Synchronization: Critical Section Problem, Requirements for a solution to the critical section problem; Semaphores,simple solution to Readers-Writers Problem. Deadlock: Characterization, Prevention, Avoidance, Banker's Algorithm, Recovery from Deadlock. Memory Management: Physical and virtual address space, Paging, Overview of Segmentation;Virtual Memory Management: Concept,Page Replacement techniques- FIFO, LRU, Optimal

### Unit III

Linux:features of Linux, steps of Installation, Shell and kernel, Directory structure, Users and groups,file permissions, commands- ls, cat, cd, pwd, chmod, mkdir, rm, rmdir, mv, cp, man, apt, cal, uname, history etc. ; Installing packages; Shell scripts: writing and executing a shell script,shell variables, read and expr, decision making (if else,case), for and while loops.

### Suggested Readings

1. Operating System Principles  By Abraham Silberschatz, Peter Baer Galvin (John Wiley And Sons        Inc.)
2. Operating System Concepts   And Design By Milan Milen Kovic (Tata Mcgraw Hill)
3. Modern Operating System      Andrew        S. Tanenbaum,        Herbert        Bos
4. Linux  in easy steps, Mike McGrath, in easy steps limited
5. Unix concepts and applications , TMH, Sumitabha Das

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

**MCSEC-401 Malware Analysis**

*Instructions for Paper setters*

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

## Unit I

Introduction to malware, Types of malwares, Basic Static and Dynamic Analysis, Overview of Windows file format, PEView.exe, Patching Binaries , Disassembly(objdump, IDA Pro), Introduction to IDA, Introduction to Reverse Engineering, Extended Reverse Engineering using GDB and IDA;

## Unit II

Advanced Dynamic Analysis - debugging tools and concepts, Malware Behavior - malicious activities and techniques, Analyzing Windows programs – WinAPI, Handles ,Networking , COM, Data Encoding, Malware Countermeasures , Covert Launching and Execution, Anti Analysis - Anti Disassembly, VM, Debugging;

## Unit III

Packers – packing and unpacking, Intro to Kernel – Kernel basics, Windows Kernel API, Windows Drivers, Kernel Debugging, Rootkit Techniques- Hooking, Patching, Kernel Object Manipulation , Rootkit Anti-forensics , Covert analysis.

**Suggested Readings:**

1. Michael Sikorski and Andrew Honig, " Practical Malware Analysis", No Starch Press,2012
2. Jamie Butler and Greg Hoglund, "Rootkits: Subverting the Windows Kernel", Addison-Wesley, 2005
3. Dang, Gazet and Bachaalany, "Practical Reverse Engineering",Wiley,2014
4. Reverend Bill Blunden, "The Rootkit Arsenal: Escape and Evasion in the Dark Corners of the System" Second Edition,Jones& Bartlett, 2012.

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

**MCSEC-402 Mobile and Wireless Security**

### *Instructions for Paper setters*

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

### Unit I

INTRODUCTION: Security and Privacy for Mobile and Wireless Networks: Introduction-State of the Art- Areas for Future Research- General Recommendation for Research. Pervasive Systems: Enhancing Trust Negotiation with Privacy Support: Trust Negotiation-Weakness of Trust Negotiation- Extending Trust Negotiation to Support Privacy.

### Unit II

MOBILE SECURITY: Mobile system architectures, Overview of mobile cellular systems, GSM and UMTS Security & Attacks, Vulnerabilities in Cellular Services, Cellular Jamming Attacks & Mitigation, Security in Cellular VoIP Services, Mobile application security. SECURING WIRELESS NETWORKS: Overview of Wireless security, Scanning and Enumerating 802.11 Networks, Attacking 802.11 Networks, Attacking WPA protected 802.11 Networks;

### Unit III

Bluetooth Scanning and Reconnaissance, Bluetooth Eavesdropping, Attacking and Exploiting Bluetooth, Zigbee Security, Zigbee Attacks; ADHOC NETWORK SECURITY: Security in Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management in Adhoc Wireless Networks, Secure Routing in Adhoc Wireless Networks

**Suggested Readings:**

1. C. Siva Ram Murthy, B.S. Manoj, "Adhoc Wireless Networks Architectures and Protocols", Prentice Hall, x ISBN 9788131706885, 2007.
2. **Noureddine Boudriga,"Security of Mobile Communications", ISBN 9780849379413, 2010**
3. KMakki, PReiher, et. al. "Mobile and Wireless Network Security and Privacy", Springer, 2007
4. Levente Buttyan, JPHubaux. "Security and Cooperationin Wireless Networks",Cambridge University Press,2008.

Duration: 3 Hours

Maximum Marks: 50
Minimum Passing Marks: 13

## MCSEC-403 Intrusion Detection and Prevention Systems

### Instructions for Paper setters

The question paper contains 3 sections. **Section-A** consists of 10 questions (at least 3 questions from each unit of syllabus). **Section-B** will consist of 9 questions (3 questions from each unit of syllabus). **Section-C** will consist of 6 questions (2 questions from each unit of syllabus).

### Unit I

Concept and definition , Internal and external threats to data, attacks, Need and types of IDS, Information sources Host based information sources, Network based information sources. Intrusion Prevention Systems, Network IDs protocol based IDs ,Hybrid IDs, Analysis schemes, thinking about intrusion.

### Unit II

A model for intrusion analysis , techniques, types of responses mapping, responses to policy Vulnerability analysis, credential analysis, non credential analysis; Introduction to Snort, Snort Installation Scenarios, Installing Snort, Running Snort on Multiple Network Interfaces, Snort Command Line Options. Step-By-Step Procedure to Compile and Install Snort Location of Snort Files, Snort Modes Snort Alert Modes.

### Unit III

Working with Snort Rules, Rule Headers, Rule Options, The SnortConfiguration File etc. Plugins, Preprocessors and Output Modules, Using Snort with MySQL,Using ACID and Snort Snarf with Snort, Agent development for intrusion detection, Architecture models of IDs and IPs.

### Suggested Readings:

1. Rafeeq Rehman : " Intrusion Detection with SNORT, Apache, MySQL, PHP and ACID," 1st Edition, Prentice Hall , 2003.
2. Christopher Kruegel,Fredrik Valeur, Giovanni Vigna: "IntrusionDetection and Correlation Challenges and Solutions", 1st Edition, Springer, 2005.
3. Carl Endorf, Eugene Schultz and Jim Mellander "Intrusion Detection & Prevention", 1st Edition, Tata McGraw-Hill, 2004.
4. Stephen Northcutt, Judy Novak : "Network Intrusion Detection", 3rdEdition, New Riders Publishing, 2002.
5. T. Fahringer, R. Prodan, "A Text book on Grid Application Development and Computing Environment". 6th Edition, Khanna Publishers, 2012.

6.  Ali     A. Ghorbani, Wei Lu, "Network Intrusion Detection and Prevention: Concepts and Techniques", Springer, 2010
7.  Paul    E. Proctor, "The Practical Intrusion Detection Handbook ",Prentice Hall , 2001.
8.  Ankit   Fadia and Mnu Zacharia, "Intrusion Alert", Vikas Publishing      house Pvt., Ltd, 2007
9.  Earl    Carter, Jonathan Hogue, "Intrusion Prevention Fundamentals",     Pearson Education, 2006.

## Practical Training and Project Work:

1. Project Work may be done individually or in groups in case of bigger projects. However if the project is done in a group each student must be given a responsibility for a distinct module and care should be taken to monitor the individual student.
2. Project Work can be carried out in the college or outside with prior permission of college.
3. The Student must submit a synopsis of the project report to the college for approval. The Project Guide can accept the project or suggest modification for resubmission. Only on acceptance of the draft project report the student should make the final copies.
4. **The Project Report should be hand written**

**Submission Copy:**
The Student should submit a spiral bound copy of the project report.

**Format of the Project:**

(a) **Paper:**
  The Report shall be typed on White Paper of A4 size.

(b) **Final Submission:**
  The Report to be submitted must be original.

(c) **Typing:**
  **Font:-** Times New Roman
  **Heading:-** 16 pt., Bold
  **Subheading:-** 14 pt, Bold
  **Content:-** 12 pt.
  **Line Spacing:-** 1.5 line.
  **Typing Side :-** One Side
  **Font Color:-** Black.

(d) **Margins:**
  The typing must be done in the following margin:
  **Left** : 0.75"
  **Right**: 0.75"
  **Top**: 1"
  **Bottom**: 1"
  **Left Gutter:** 0.5"

(e) **Binding:**
  The report shall be Spiral Bound.

(f) **Title Cover:**
  The Title cover should contain the following details:
  **Top:** Project Title in block capitals of 16pt.
  **Centre:** Name of project developer's and Guide name.
  **Bottom:** Name of the university, Year of submission all in block capitals of 14pt letters on separate lines with proper spacing and centering.

(g) **Blank sheets:**
  At the beginning and end of the report, two white blank papers should be provided, one for the Purpose of Binding and other to be left blank.

(h) **Content:**
  I). Acknowledgement
  II). Institute/College/Organization certificate where the project is being developed.

**III).** Table of contents

**IV).** A brief overview of project

**V).** Profiles of problem assigned

**VI).** Study of Existing System

**VII).** System Requirement

**VIII).** Project plan

o Team Structure

o Development Schedule

o Programming language and Development Tools

**IX).** Requirement Specification

**X).** Design

o Detailed DFD and Structure Diagram

o Data structure, Database and File Specification

**XI).** Project Legacy

o Current Status of project

o Remaining Areas of concern

o Technical and Managerial Lessons Learnt

o Future Recommendations

**XII).** Nomenclature and Abbreviations.

**XIII).** Bibliography

**XIV).** Source Code.

# M. G. S. UNIVERISTY, BIKANER

# SYLLABUS

**Master of Arts**
**Drawing and Painting**
**(Semester System)**
**Session-2021-22**



# Maharaja Ganga Singh

# University

# Bikaner

**Learning Outcome-based Curriculum Frame Work (LOCF)**

for

# Master of Arts
# Drawing and Painting

# Department of Drawing and Painting
# Maharaja Ganga Singh University, Bikaner

# Background

Considering the curricular reforms as instrumental for desired learning outcomes, all the academic Department of Maharaja Ganga Singh University made a rigorous attempt to revise the curriculum of postgraduate programmes in alignment with National Education Policy-2020 and UGC Quality Mandate for Higher Education Institutions-2021. The process of revising the curriculum could be prompted with the adoption of "Comprehensive Roadmap for Implementation of NEP". The Roadmap identified the key features of the Policy and elucidated the Action Plan with well-defined responsibilities and indicative timeline for major academic reforms.

The process of revamping the curriculum started with the series of webinars and discussions conducted by the University to orient the teachers about the key features of the Policy, enabling them to revise the curriculum in sync with the Policy. Proper orientation of the faculty about the vision and provisions of NEP-2020 made it easier for them to appreciate and incorporate the vital aspects of the Policy in the revised curriculum focusing on creating holistic, thoughtful, creative and well-rounded individuals equipped with the key 21st century skills 'for the development of an enlightened, socially conscious, knowledgeable, and skilled nation'.

With NEP-2020 in background, the revised curricula articulate the spirit of the Policy by emphasising upon- integrated approach to learning; innovative pedagogies and assessment strategies; multidisciplinary and cross-disciplinary education; creative and critical thinking; ethical and Constitutional values through value-based courses; 21st century capabilities across the range of disciplines through life skills, entrepreneurial and professional skills; community and constructive public engagement; social, moral and environmental awareness; Organic Living and Global Citizenship Education (GCED); holistic, inquiry-based, discovery-based, discussion-based, and analysis-based learning; exposure to Indian knowledge system, cultural traditions and classical literature through relevant courses offering 'Knowledge of India'; fine blend of modern pedagogies with indigenous and traditional ways of learning; flexibility in course choices; student-centric participatory learning; imaginative and flexible curricular structures to enable creative combination of disciplines for study; offering multiple entry and exit points, alignment of Vocational courses with the International Standard Classification of Occupations maintained by the International Labour Organization; breaking the silos of disciplines; integration of extra-curricular and curricular aspects; exploring internships with local industry, businesses, artists and crafts persons; closer collaborations between industry and higher education institutions for technical, vocational and science progammes; and formative assessment tools to be aligned with the learning outcomes, capabilities, and dispositions as specified for each course. The University has also developed consensus on adoption of Blended Learning with 10% component of online teaching and 90% face to face classes for each programme.

The revised curricula of various programmes could be devised with concerted efforts of the Faculty, Heads of the Departments and Deans of Schools of Study. The draft prepared by each department was discussed in series of discussion sessions conducted at Department, Faculty and

3

the University level. The leadership of the University has been a driving force behind the entire exercise of developing the uniform template and structure for the revised curriculum. The Vice Chancellor of the University conducted series of meetings with Heads and Deans to deliberate upon the vital parameters of the revised curriculum to formulate a uniform template featuring Background, Programme Outcomes, Programme Specific Outcomes, Postgraduate Attributes, Structure of Masters Course, Learning Outcome Index, Semester-wise Courses and Credit Distribution, Course-level Learning Outcomes, Teaching-Learning Process, Blended Learning, Assessment and Evaluation, Keywords, References and Appendices. The experts of various Boards of Studies and Faculties contributed to a large extent in giving the final shape to the revised curriculum of each programme.

**To ensure the implementation of curricular reforms envisioned in NEP-2020, the University has decided to implement various provisions in a phased manner. Therefore, the curriculum may be reviewed annually so as to gradually include all relevant provisions of NEP-2020.**

## Programme Outcomes (POs)

|       | Description |
|-------|-------------|
| PO-1  | Understand the World, their country, their society as well as themselves and have awareness of ethical problems, social rights, values and responsibility to the self and to others. |
| PO-2  | Demonstrate critical understanding of the subjects of Languages, psychology and philosophy in their varies forms. |
| PO-3  | Develop creative and critical insights, aesthetic sensibility, analytical skills, and Psychological and Philosophical insights. |
| PO-4  | Follow innovations and developments in Psychology, Philosophy and varied languages such as such as English, Hindi, Urdu, Punjabi,Sanskritetc and demonstrate personal and organizational entrepreneurship and engage in life-long learning. |
| PO-5  | Develop knowledge of theories, concepts and research methods in Humanities and Social Sciences. |
| PO-6  | Communicate effectively in English, Hindi, Sanskrit, Urdu and Punjabi by oral, written, graphical and technological means. |
| PO-7  | Know how to access written and visual, primary and secondary sources of information, interpret concepts and data from a variety of sources in developing disciplinary and inter disciplinary analyses. |
| PO-8  | Demonstrate skills to conduct research in accordance with the ethical standards of the discipline. |
| PO-9  | Exercise values that reflect commitment to diversity and contribution to society. |
| PO-10 | Apply Psychological, Philosophical and linguistic knowledge and scientific thinking in writing and speaking skills in Professional settings. |
| PO-11 | Develop advanced research designs and apply advanced statistical analyses. |
| PO-12 | Develop effective teaching skills and be able to satisfy the University and the School |

| | |
|---|---|
| | level expectations. |
| PO-13 | Develop the skills to appreciate and participate in citizenship in the academic community, in the larger community and in the world and be able to foster Bhartiya ideals including truth and justice. |
| PO-14 | Develop the skills to apply the Philosophy and Psychology of language. |

## Programme Specific Outcomes(PSOs)

The Program Outcome (PSO) are the Statement of Competencies/ abilities. PSOS are the statement describes the knowledge and abilities the Post Graduate have by the end of Program Studies.

| | Description |
|---|---|
| PSO-1 | To acquaint the students with significant art movements and its impact on society and fine arts |
| PSO-2 | To offer insights into different cultural, textual and value traditions of the world through various art forms |
| PSO-3 | To develop openness to new ideas, perspectives and ways of thinking through fine arts |
| PSO-4 | To infuse aesthetic sensibility, critical and analytical skills along with creativity |
| PSO-5 | To interpret the critical ideas, values and themes that appear in the literary, cultural texts and various art forms and to understand the way these ideas, values themes inform and impact culture, society and fine arts |
| PSO-6 | To demonstrate a command of fine arts including the ability to organize  and present material in a cogent fashion and employ effectively fine arts |
| PSO-7 | To analysize, interpret and create form and content of work of art |
| PSO-8 | To develop the analytical and technical skills and organize and apply the visual elements to communicate concepts and experiences across various media |

## Learning Outcome Index

## I. Programme Outcomes (PO) and Programme Specific Outcomes (PSO)

| PO | PSO-1 | PSO-2 | PSO-3 | PSO-4 | PSO-5 | PSO-6 | PSO-7 | PSO-8 | PSO-9 | PSO-10 |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| PO-1 | X | | X | X | X | X | | X | X | X |
| PO-2 | | X | X | | X | X | X | X | | X |
| PO-3 | X | | X | X | | X | X | X | X | |
| PO-4 | X | X | X | X | X | X | X | | X | X |
| PO-5 | X | X | X | X | X | | X | X | X | |
| PO-6 | X | X | X | | X | X | X | | X | X |
| PO-7 | X | X | X | | X | X | X | X | X | |
| PO-8 | | X | X | X | X | X | X | X | X | X |

## I. Core Courses (CC):

| PSO | CC-1 | CC-2 | CC-3 | CC-4 | CC-5 | CC-6 | CC-7 | CC-8 | CC-9 | CC-10 | CC-11 | CC-12 | CC-13 | CC-14 | CC-15 | CC-16 | CC-17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSO-1 | X |  | X | X | X | X |  | X | X | X | X | X | X | X | X | X | X |
| PSO-2 |  | X | X |  | X | X | X | X |  | X | X | X | X | X |  | X | X |
| PSO-3 | X |  | X | X |  | X | X | X | X |  | X | X | X | X | X | X | X |
| PSO-4 | X | X | X | X | X | X | X |  | X | X | X | X |  | X |  | X | X |
| PSO-5 | X | X | X | X | X |  | X | X | X |  | X | X | X |  | X | X | X |
| PSO-6 | X | X | X |  | X | X | X |  | X | X | X | X | X | X | X | X | X |
| PSO-7 | X | X | X |  | X | X | X | X | X |  | X | X | X |  | X | X | X |
| PSO-8 |  | X | X | X | X | X | X | X | X | X | X | X |  | X | X | X | X |

## II. Elective Courses (EC):

| PSO | EC-1 | EC-2 | EC-3 | EC-4 | EC-5 | EC-6 | EC-7 | EC-8 | EC-9 | EC-10 | EC-11 | EC-12 | EC-13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSO-1 | X | X | X |   | X | X | X |   | X | X | X | X | X |
| PSO-2 | X |   | X | X |   | X | X | X | X | X |   | X | X |
| PSO-3 |   | X | X | X | X | X |   | X | X | X | X |   | X |
| PSO-4 | X | X | X | X | X |   | X | X |   | X | X | X | X |
| PSO-5 | X | X |   | X | X | X |   | X | X | X |   | X | X |
| PSO-6 | X |   | X | X |   | X | X |   | X |   | X | X | X |
| PSO-7 | X | X | X |   | X | X |   | X | X | X | X | X | X |
| PSO-8 |   | X | X | X | X |   | X | X |   | X | X | X | X |

**Postgraduate Attributes**
- Disciplinary Knowledge
- Creative and Critical Thinking
- Analytical Reasoning
- Communication Skills through Art
- Life Skills
- Multi-Cultural Competence
- Moral and Ethical Values
- Life Long Learning
- Global
- Competency

## Teaching Learning Process
- Lectures
- Discussions
- Simulations
- Role Playing
- Participative Learning
- Interactive Sessions
- Seminars
- Research-based Learning/Dissertation or Project Work
- Technology-embedded Learning

## STRUCTURE OF PROGRAMME
### SEMESTER-I

| Sr. | Course Title | Course Code | L | T | P | Credits |
|---|---|---|---|---|---|---|
| **Core Foundation Course** | | | | | | |
| (i) | Fundamentals of Arts | FA-D&P-CF-100 | 4 | 1 | 0 | 5 |
| **Core Compulsory Courses** | | | | | | |
| (i) | A Study of Eastern and Western Aesthetics –I | FA-D&P-CC-101 | 4 | 1 | 0 | 5 |
| (ii) | History of Indian Art –I | FA-D&P-CC-102 | 4 | 1 | 0 | 5 |
| (iii) | Landscape (Monochrome) Practical | FA-D&P-CC-103 | 2 | 1 | 2 | 5 |
| (iv) | Portrait Study (Monochrome) Practical | FA-D&P-CC-104 | 2 | 1 | 2 | 5 |

### SEMESTER-II

| Sr. | Course Title | Course Code | LTP | | | Credits |
|---|---|---|---|---|---|---|
| **Core Foundation Course** | | | | | | |
| (ii) | National And Human Values | FA-D&P-CF-200 | 4 | 1 | 0 | 5 |
| **Core Compulsory Courses** | | | | | | |
| (v) | A Study of Eastern and Western Aesthetics –II | FA-D&P-CC-201 | 4 | 1 | 0 | 5 |
| (vi) | History Of Indian Art-II | FA-D&P-CC-202 | 4 | 1 | 0 | 5 |
| (vii) | Landscape (Coloured) Practical | FA-D&P-CC-203 | 2 | 1 | 2 | 5 |
| (viii) | Portrait Study (Coloured) Practical | FA-D&P-CC-204 | 2 | 1 | 2 | 5 |

**SEMESTER-III**

| Sr. | Course Title | Course Code | L | T | P | Credits |
|-----|-------------|-------------|---|---|---|---------|
| **Core Compulsory Courses** | | | | | | |
| (ix) | History and Philosophy of Modern Art-I | FA-D&P-CC-301 | 4 | 1 | 0 | 5 |
| (x) | History Of Western Art –I | FA-D&P-CC-302 | 4 | 1 | 0 | 5 |
| **Core Elective Courses** | | | | | | |
| (xi)A | Composition (Figurative) Practical | FA-D&P-CE-303A | 2 | 1 | 2 | 5 |
| | or | | | | | |
| (xi) B | Print Making (Leno) Practical | FA-D&P-CE-303B | 2 | 1 | 2 | 5 |
| | | | | | | |
| (xii)A | Nature Study (Monochrome) Practical | FA-D&P-CE-304A | 2 | 1 | 2 | 5 |
| | or | | | | | |
| (xii) B | Creative Still Life (Monochrome) Practical | FA-D&P-CE-304B | 2 | 1 | 2 | 5 |
| | or | | | | | |
| (xii) C | Life Study (Monochrome) Practical | FA-D&P-CC-304C | 2 | 1 | 2 | 5 |
| **Open Elective Courses** | | | | | | |
| (xiii) A | 2D Design (Monochrome) Practical | FA-D&P-OE-305A | 2 | 1 | 2 | 5 |
| | or | | | | | |
| (xiii) B | Rendering (Monochrome) Practical | FA-D&P-OE-305B | 2 | 1 | 2 | 5 |

**SEMESTER-IV**

| Sr. | Course Title | Course Code | L | T | P | Credits |
|-----|-------------|-------------|---|---|---|---------|
| | **Core Course** | | | | | |
| (xiv) | History and Philosophy of Modern Art -II | FA-D&P-CC-401 | 4 | 1 | 0 | 5 |
| (xv) | History of Western Art –II | FA-D&P-CC-402 | 4 | 1 | 0 | 5 |
| | **Core Elective Courses** | | | | | |
| (xvi)A | Composition (Non-Figurative) Practical | FA-D&P-CE-403A | 2 | 1 | 2 | 5 |
| | or | | | | | |
| (xvi)B | Print Making (Wood) Practical | FA-D&P-CE-403B | 2 | 1 | 2 | 5 |
| | | | | | | |
| (xvii)A | Nature Study (Coloured) Practical | FA-D&P-CE-404A | 2 | 1 | 2 | 5 |
| | or | | | | | |
| (xvii)B | Creative Still Life (Coloured) Practical | FA-D&P-CE-404B | 2 | 1 | 2 | 5 |
| | or | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| (xvii)C | Life Study (Coloured) Practical | FA-D&P-CC-404C | 2 | 1 | 2 | 5 |
| | **Open Elective Courses** | | | | | |
| (xviii)A | 2D Design (Coloured) Practical | FA-D&P-OE-405A | 2 | 1 | 2 | 5 |
| | or | | | | | |
| (xviii)B | Rendering (Coloured) Practical | FA-D&P-OE-405B | 2 | 1 | 2 | 5 |

**Semester-I**
**Course-Fundamentals of Arts**
**Code-FA-D&P-CF-100**

**Course Objectives:**
- To introduce the students to the fundamental of arts
- To acquaint the students with different art forms, its elements and compositions
- To familiarize the students with the creative process of arts

**Course Level Learning Outcomes:**
On the successful Completion of course, students shall be able to :-
- Understand the basics of arts
- Appreciate the aesthetics and styles of different art forms
- Learn about the basic principles of art, colour, media and its application

**Course Description:**

**Unit-I**

Meaning and Definition of Art, Visual and Performing Arts (Painting, Sculpture, Music, Dance and Drama) Deference between Fine Arts, Commercial Arts and Folk Arts

**Unit-II**

Creative Process - Observation, Perception, Imagination and Creative Expression,
Six Limbs of Indian Painting

**Unit-III**

Art Techniques and Materials Fresco (Buno and Secco), Wash and Wash,
Graphic Art (Lino, Wood, Etching)

**Unit-IV**

Elements of Painting- Line, Form, Colour, Tone, Texture, Space

**Unit-V**

Principles of Composition- Unity, Harmony, Balance, Rhythm, Dominance and Proportion

**Assessment And Evaluation**

**Internal Assessment –** Midterm Examination 10%
Term Paper 10%
Students Participation and overall performance 5%

**External Assessment- 75%**
**Terminal Examination**
**Time: 3Hours**

The Question paper shall contain three sections. Section A shall contain 10 questions two from each unit of 1.5 marks each. The candidate is required to answer all the questions. The answer should not exceed 50 words each. Section B shall contain 5questions one from each unit with internal choice. Each question shall be of 6 marks. The answer should not exceed 200 words each. The candidate is required to answer all the questions. Section C shall contain 5 questions to 10 marks each, one from each unit. The candidate is required to answer any three questions. The answer should not be more than 500 words each.

**Required Readings:**
- साखलकर र.वि., *कलाकोष*, राजस्थान हिन्दीग्रंथ अकादमी, जयपुर, 2019
- वसलीवाल मीनाक्षी, *ललितकला के आधारभूत सिद्धान्त*, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर, 2019
- जौहरी ऋतु, *भारतीय कला समीक्षा विचार व रूप*, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर, 2020

**Suggested Readings:**

- यादव नरेन्द्र सिंह, यादव अजय, *कला के नवीन स्वरूप,* राजस्थानहिन्दीग्रंथअकादमी, जयपुर, 2019
- Barrington, Barber, *The Fundamentels Of Drawing Portraits*, Arcturus publishing
- Barrington, Barber *The Complete Fundamentels Of Drawing,Capella* publishing

## Course –A Study of Eastern And
## Western Aesthetics-I
## Code-FA-D&P-CC-101

**Course Objectives**:
- To familiarize the students with the Eastern and Western aesthetics
- To enable the students, develop critical understanding of philosophy, psychology and its significance in arts
- To help students develop critical insights into the literary works and understand the texts as a means of communication

**Course Level Learning Outcomes:**
On the successful Completion of course, students shall be able to:-
- Develop an understanding about Eastern and Western Aesthetics
- Understand philosophy, psychology and its relevance to arts
- Develop an understanding about relationship between art and literature

**Course Description:**

**Unit-I**
Aesthetics of Eastern and Western Concept of Beauty
**Unit-II**
Plato, Aristotle, Augustine
**Unit-III**
Leonardo da Vinci, Baumgarten, Hegel
**Unit-IV**
Shelling, Kant
**Unit-V**
Freud, Tolstoy, Moorie sweitz

**Assessment And Evaluation**

**Internal Assessment –** Midterm Examination 10%

Term Paper 10%

Students Participation and overall performance 5%

**External Assessment-** **75%**
**Terminal Examination**
**Time: 3Hours**

The Question paper shall contain three sections. Section A shall contain 10 questions two from each unit of 1.5 marks each. The candidate is required to answer all the questions.The answer should not exceed 50 words each. Section B shall contain 5 questions one from each unit with internal choice. Each question shall be of 6 marks. The answer should not exceed 200 words each. The candidate is required to answer all the questions. Section C shall contain 5 questions to 10 marks each, one from each unit. The candidate is required to answer any three questions. The answer should not be more than 500 words each.

**Required Readings:**
- चतुर्वेदी ममता,*सौंदर्यशास्त्र–*राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर, 2020
- Kumaraswami A .K, *Christian And Oriental Philosophy of Art*, Dover Publications 2011.
- Gaunt William, *Aesthetics Adventure* ,West Richard,1945
- Gillbert Katherine ,*History of Aesthetics, The journal of* Aesthetics and art criticism volume -1,1941

**Suggested Readings:**

- Gillbert K.G.*History of Western Aesthetics,* New York: The Macmillan Co1939.

- Pandey K.C.*History of Western Aesthetics,*The Chowk jhamba Sanskrit Series Office1972.

- Pandey K.C.*History of Oriental Aesthetics,* The Journal of Aesthetics and Art Criticism.

## Course - History of Indian Art -I
## Code-FA-D&P-CC-102

**Course Objectives:**
- To enable the students, understand the relationship between art, history and culture
- To enable the students to know about different School of arts
- To familiarize the students with Visual arts and its complexities

**Course Level Learning Outcomes:**

On the successful Completion of course, students shall be able to :-
- Learn about different schools of arts and the difference in the art forms
- Understand about Indian Arts and different aspects of beauty
- Recognize elements of design in the works of art

**Course Description**

**Unit-I**

Prehistoric Indian Paintings

**Unit-II**

Mohan jodaroh and Harapa,  Jogimara Cave

**Unit-III**

Ajanta, Bagh, Sigiria

**Unit-IV**

Paland Jain School, Rajasthani School

**Unit-V**

Pahari School, Mughal School

**Assessment And Evaluation**

**Internal Assessment** –   Midterm Examination                                10%

                Term Paper                                                10%

                Students Participation and overall performance          5%

**External Assessment-          75%**
**Terminal Examination**
**Time: 3 Hours**

The Question paper shall contain three sections. Section A shall contain10questions two from each unit of 1.5marks each. The candidate is required to answer all the questions. The answer should not exceed 50 words each. Section B shall contain 5 questions one from each unit with internal choice. Each question shall be of 6 marks. The answer should not exceed 200 words each. The candidate is required to answer all the questions. Section C shall contain 5 questions to 10 marks each, one from each unit. The candidate is required to answer any three questions. The answer should not be more than 500 words each.

**Required Readings:**

- प्रताप रीता,*भारतीय चित्रकला एवं मूर्तिकला का इतिहास,* राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर, 2021
- Brown Percy, *Indian Painting*, Read Books 2007
- Galbraith, *Indian Painting,* Houghton Mifflin,1968
- Kramrisch Stella, *The Art of India* , Phaidon Press 1965

**Suggested Reading:**

- Brown Percy *Indian Painting*, Association Press, Calcutta,1920
- Randhava M. S., *Indian Painting*, Roli Books,1981
- Galbraith, *Indian Painting*, Houghton Mifflin,1968

## Course-Landscape (Monochrome)
## Code-FA-D&P-CC-103

**Course Objectives:**
- To understand the part of Objects, Lives and Still Life
- To develop the observation power in a very personalized manner
- To familiarize the students with ratio, nature, proportion, shape, perspective, comprehension and speciality with detail characteristics of the subject

**Course Level Learning Outcomes:**
On the successful Completion of course, students shall be able to :-
- Understand the part of Objects, Lives and Still life
- Develop observation power and learn minuteness of different art forms
- Understand characteristics of ratios, nature, proportion, shape, perspective, comprehension

**Course Description:**
Students shall work on Landscape, Study from nature, Street Scrapes and a City Scrape with Historical Monuments.
Importance must be given to proportion- aerial and linear perspective, Students shall develop the skill of proper handling and treatment of media

**Assessment And Evaluation**
Internal Assessment- *Submission Work- 20%
External Assessment- 80%

**Terminal Examination**
**Time: 10 hours**
Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24 hours before the scheduled date of Examination.

<center>**Size of paper-1/2 Imperial**</center>
<center>**Medium- Charcoal, Graphite, Blackink**</center>

**\*Submission work: -**
The Submission work the shall include following:
I.    5Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
II.    The student will have to prepare a sketch book containing not less than 50 sketches. Pencil or Colour Sketches of Human , Animal , Study of trees , Lanes , Human faces &Body parts etc.
III- The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

<center>**Course - Portrait Study (Monochrome)**</center>
<center>**Code-FA-D&P- CC-104**</center>

**Course objectives**:
- To enable the students, know about preparation of portrait from life and its transformation into composition.
- To enable the student, know art work and analyse the work contextually
- To develop independent artistic thinking and aptitude for a rigorous studio practice.

**Course Level Learning Outcomes**:
On the successful Completion of course, students will be able to :-
- Understand about the portrait from life and its transformation into composition.
- Learn about the human anatomy and drawing.
- Demonstrate independent artistic thinking and aptitude by depiction

**Course Description**
Students shall work on portrait from Model of different age groups showing characteristics, vitality, resemblance, proportion, features etc.

**Assessment and Evaluation**
Internal Assessment-        *Submission Work- 20%
External Assessment-        80%

**Terminal Examination**
**Time: 10 hours**
Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24 hours before the scheduled date of Examination.

<center>**Size-1/2 Imperial**</center>
<center>**Medium- Charcoal, Graphite, Black ink**</center>

**\*Submission work: -**
The submission work shall include the following:
I.      5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
II.     The student will have to prepare a sketch book containing not less than 50 sketches. Paper, Pencil or Colour Sketches' of Human , Animal , Study of trees , Lanes , Human faces & Body parts etc.
III- The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

<div align="center">

**Semester-II**
**Course -National and Human Values**
**Course Code -FA- ENG -CF-200**

</div>

**Course Objectives:**
-   To inculcate national and human values in the Students
-   To enable the students, imbibe the Indian cultural ethos
-   To inculcate the spirit of Patriotism so that the students, develop a sense of strong bond with the nation
-   To enable the students, grow into a citizen possessing civic sense

**Course Level Learning Outcomes:**
        On the completion of the course the students shall be able to
-   Attain the civic skills enabling him/her to become a well-behaved citizen of the country.
-   Imbibe and spread the feelings of devotion and dedication.

**Course Description:**

<div align="center">

**Unit-I**

</div>

**NCC** – Introduction, Aims, NCC Flag, NCC Song, NCC Administration, Raising of NCC in Schools/Colleges, NCC: Rank, Honours and Awards, NCC Training, NCC Camps, NCC Examinations, Incentive and Scholarship for Cadets.

**Importance of Discipline in life**, Aims and Merits of Discipline, Problems related to Indiscipline and Solutions.

**Drill** – Definition, Principles of Drill, Bad habits in drill, Words of Command, Drill Movements, Arms Drill, Squad Drill, Guard of Honour, Ceremonial Drill, Guard Mounting.

Contribution of NCC in Nation Building.

<div align="center">

**Unit-II**

</div>

**Armed Forces** – Control Command, Organization of Armed Forces, Weapons of Army, Navy and Air Force, Training institutes, Honours and Awards, Recipients of Param Veer Chakra, Badges of Ranks.

**Commission in Armed Forces** – Recruitment in Armed Forces, Commission in Technical, Non-Technical and Territorial Forces.

**Weapon Training** – 0.22 Rifle, 7.62 Rifle, 7.62 SLR (Self Loading Rifle), 5.56 MM I.N.S.A.S. Rifle, L.M.G. (Light Machine Gun), Stan Machine Carbine, 2" Mortar, Grenade, Pistol, Various types of Firing, Range Procedure and Range Drill.

Military History and Geography, Field Craft, Field Engineering, Battle Craft.

<div align="center">

**Unit-III**

</div>

Obstacle Training. Adventure Training, Self Defence, Physical Posture Training.
Social Service, Disaster Management, Health and Hygiene, First Aid.
Leadership, Personality Development, Decision Making, Motivation, Duty and Discipline, Morale.

<div align="center">

**Unit-IV**

</div>

**Value System** – The Role of Culture and Civilization-Holistic living
Balancing the outer and inner – Body, Mind and Intellectual level- Duties and responsibilities
**Salient Values for Life**- Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity, and inclusiveness

Self-esteem and Self Confidence
punctuality – Time, task and resource management, Team work
Positive and creative thinking.

### Unit-V

Universal Declaration of Human Rights
Human Rights violations
National Integration – Peace and non-violence (in context of Gandhi, Vivekananda)
Social Values and Welfare of the citizen
The role of media in value building
Fundamental Duties
Environment and Ecological balance – interdependence of all beings – living and non-living.

**Assessment and Evaluation:**

The Students shall be assessed and evaluated as per the schedule given below –
1. Project Report / Case Study (in 5000-7000 words handwritten) – 75%
2. Viva-voce  - 25%

The topics for the Project Report / Case Study shall be allotted by the Nodal Department (decided jointly with NSS wing under the supervision or IQAC) in consultation with the Department concerned. The Candidate shall submit the Report by the date fixed for the said purpose. It shall then be followed by a Viva-voce Examination. The whole evaluation shall be done by the Departmental Internal Faculty in consultation with the Nodal Department. It is a non-creditable Paper. The student will have to score simply a qualifying score/grade as specified in the CBCS rules.

The candidate will have to qualify the paper by the time He / She qualifies for the Programme. He/She can avail maximum 3 chances along with the Semester Examinations.

**Suggested Readings:**

- Hand Book of NCC : Major R C Mishra & Sanjay Kumar Mishra
- National Security: K. Subramanyam
- ASEAN Security: Air Comdr. Jasjit Singh
- Indian Political System, Dr .Pukhraj Jain &Dr. Kuldeep Fadiya
- हैण्ड बुक ऑफ एनसीसी,मेजर आर.सी.मिश्र एवं संजय कुमार मिश्र
- अन्तर्राष्ट्रीय राजनीतिःवी.एल.फाड़िया
- भारतीय राजव्यवस्था,डॉ.पुखराज जैन,डॉ.कुलदीप फड़िया
- राष्ट्रीय प्रतिरक्षाः डॉ.हरवीर शर्मा,जय प्रकाश नाथ कंपनी, मेरठ
- राष्ट्रीय सुरक्षाः डॉ.लल्लनसिंह,प्रकाश बुक डिपो,बरेली
- राष्ट्रीय सुरक्षाः डॉ.नरेन्द्रसिंह,प्रकाश बुक डिपो,बरेली
- राष्ट्रीय सुरक्षाः डॉ.पाण्डेयवपाण्डेय,प्रकाश बुक डिपो,बरेली
- राष्ट्रीय रक्षा व सुरक्षाः डॉ.एस.के.मिश्र,मार्डन पब्लिशर्स,जालंधर
- NCERT, *Education in Values*, New Delhi, 1992.
- M.G.Chitakra: *Education and Human Values*, A.P.H. Publishing Corporation, New Delhi,2003.
- Chakravarthy, S.K.: *Values and ethics for Organizations: Theory and Practice,* Oxford University Press, New Delhi, 1999.
- Satchidananda, M.K.: *Ethics, Education, Indian Unity and Culture*, AjanthaPublications,Delhi, 1991.
- Das, M.S. & Gupta, V.K.: *Social Values among Young adults: A Changing Scenario*, M.D.Publications, New Delhi, 1995.
- Bandiste, D.D.: *Humanist Values: A Source Book,* B.R. Publishing Corporation, Delhi,1999.
- Ruhela, S.P. :*Human Values and Eeducation,* Sterling Publications, New Delhi, 1986.
- Kaul, G.N.: *Values and Education in Independent Indian*, Associated Publishers, Mumbai,1975.
- Swami Budhananda (1983) *How to Build Character A Primer* : Ramakrishna Mission, NewDelhi.
- *A Cultural Heritage of India (4 Vols.),*Bharatiya Vidya Bhavan, Bombay. (Selected Chapters only) For Life, For the future : Reserves and Remains –UNESCO Publication.
- Values, *A Vedanta Kesari Presentation*, Sri Ramakrishna Math, Chennai, 1996.

- Swami Vivekananda, *Youth and Modern India*, Ramakrishna Mission, Chennai.
- Swami Vivekananda, *Call to the Youth for Nation Building*, Advaita Ashrama, Calcutta.
- *Awakening Indians to India*, Chinmayananda Mission, 2003.

**Course-A Study of Eastern And**
**Western Aesthetics-II**
**Code-FA-D&P-CC-201**

**Course Objectives**:
- To introduce the students about gradual shift in Art and its various forms
- To develop critical understanding of Indian Vedic philosophy and Literature and its relevance to Art
- To develop a keen insight into the Contribution of Indian and Western philosophy in development of Art

**Course Level Learning Outcomes:**
On the completion of the Course, the Students shall be able to:-
- Understand the major artistic styles and genres of western and Indian art and architecture through a broad range of time periods to present
- Develop critical Understanding of Indian Vedic philosophy and Literature and its relevance to Art
- Develop an understanding about contribution of Indian and Western philosophy

**Course Description      :**

**Unit-I**
Croche, George Santayana, S.K.langer
**Unit-II**
I.A. Richards, Roger Fry
**Unit-III**
Natya shastra, Ras-Sidhant
**Unit-IV**
Vatsayayana, Vishnudharmotar Puran
**Unit-V**
Shaiv,  Budha,  RavindranathTagore, A.K. Kumarswami

 **Assessment And Evaluation**
**Internal Assessment –**    Midterm Examination                             10%
                             Term Paper                                        10%
                             Students Participation and overall performance        5%

**External Assessment-        75%**
**Terminal Examination**
**Time: 3 Hours**

The Question paper shall contain three sections. Section A shall contain 10 questions two from each unit of 1.5 marks each. The candidate is required to answer all the questions. The answer should not exceed 50 words each.Section B shall contain 5 questions one from each unit with internal choice. Each question shall be of 6 marks. The answer should not exceed 200 words each. The candidate is required to answer all the questions. Section C shall contain 5 questions to 10 marks each, one from each unit. The candidate is required to answer any three questions. The answer should not be more than 500 words each.

**Required Readings:**
- चतुर्वेदी ममता,*सौंदर्यशास्त्र*–राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर, 17 वाँ संस्करण,2020 ।
-  Kumaraswami, A.K., *Christian And Oriental Philosophy of Art*, Dover Publications 2011.
-  Gaunt, William, *Aesthetics Adventure ,*West Richard,1945
-  Gillbert, Katherine ,*History of Aesthetics,The journal of* Aesthetics and Art Criticism Volume -1,1941

**Suggested Readings:**

- Gillbert , K.G., *History of  Western Aesthetics* New York: The Macmillan Co1939.

- Pandey, K.C.,.*History of Western Aesthetics*, The Chowk jhamba Sanskrit Series Office 1972.

- Pandey, K.C,.*History of Oriental Aesthetics,* The Journal of Aesthetics and Art Criticism.

**Course -History of Indian Art -II**
**Code-FA-D&P-CC-202**
**Course Objectives**
-  To know about prominent art styles in various Ages

- To compare contemporary works with their historical antecedents
- To gain effective knowledge of visual arts

**Course Level Learning Outcomes:**

On the completion of the course the students shall be able to:-

- Reflect on art and write critiques about art styles
- Demonstrate on functional knowledge of the traditions, conventions and evolutions of the discipline related to issues of illusion, meaning and representation.
- Synthesize the use of drawing and generate novel ideas

**Course Discription**

**Unit-I**
Patna Style, Raja Ravi Verma, Amrita Shergill
**Unit-II**
Renaissance, Bengal School
**Unit-III**
Ravindranath Tagore, Avnindranath Tagore,Nand Lal Bose

**Unit-IV**
Bombay Group of Art, N.S. Bendre, K.K. Hebber, S. Chavda
**Unit-V**

Contemporary Artists, M.F. Hussain, K.H. Ara, F.N. Suja, Ram Gopal Vijayvargiya

**Assessment And Evaluation**

**Internal Assessment –**    Midterm Examination                 10%
                               Term Paper                          10%
                               Students Participation and overall performance     5%

**External Assessment-**    **75%**
**Terminal Examination**
**Time: 3Hours**

The Question paper shall contain three sections. Section A shall contain 10 questions two from each unit of 1.5 marks each. The candidate is required to answer all the questions. The answer should not exceed 50 words each. Section B shall contain 5 questions one from each unit with internal choice. Each question shall be of 6 marks. The answer should not exceed 200 words each. The candidate is required to answer all the questions. Section C shall contain 5 questions to 10 marks each, one from each unit. The candidate is required to answer any three questions. The answer should not be more than 500 words each.

**Required Readings:**

- प्रताप रीता, *भारतीय चित्रकला एव मूर्तिकला का इतिहास,* राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर, 2021
- Percy Brown, *Indian Painting*, Read        Books, 2007
- Galbraith, *Indian Painting,*Houghton Mifflin, 1968
- Stella Kramrisch,*The Art of India* ,Phaidon Press,1965

**Suggested Readings:**

- Brown Percy, *IndianPainting*, Association Press,Calcutta ,1920

- Randhava M.S., *Indian Painting*, Roli Books,1981

- Kramrisch Stella, *TheArt of India*,  Edition -3, Phaidon Press,1965

- Galbraith, *Indian Painting*, Houghton Mifflin,1968

==**Course -Landscape (Coloured)**==
==**Code-FA-D&P-CC-203**==

**Course Objectives**

- To understand the study part of Objects, Lives and Still Life
- To develop the observation power in a very personalized manner
- To familiarize the student with characteristics of the subject such as ratio, nature, proportion, shape, perspective, comprehension

**Course Level Learning Outcomes**:

      On the completion of the course the students shall be able to:-
- Understand the study part of objects, lives and still life
- Develop an observation and learn to include it in drawing
- Understand detail characteristics of art forms such as ratios, nature, proportion, shape, perspective, comprehension

**Course Description**

Students shall work on Landscape, Study from Nature,Street scapes and a City Scape with Historical Monuments. Importance must be given to proportion- aerial and linear perspective, Students shall develop the skill of proper handling and treatment of media

**Assessment and Evaluation**

Internal Assessment-       \*Submission Work-   20%

External Assessment-     80%

**Terminal Examination**

**Time: 10 hours**

Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between.The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24 hours before the scheduled date of Examination.

<div align="center">

**Size ofpaper-1/2 Imperial**
**Medium-Oil Colour, WaterColour or Tempra**

</div>

**\*Submission work:-**

The Submission work shall include the following:

III.     5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.

IV.     The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human , Animal , Study of trees , Lanes , Human faces & Body parts etc.

III- The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

<div align="center">

**Course- Portrait Study (Coloured)**
**Code-FA -D&P-CC-204**

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**Course objectives**:
- To familiarize the students about preparation of portrait from life and its transformation into composition
- To encourage the studentsgenerate original ideas, communicate the contexts and concepts
- To enable the student, develop independent artistic thinking and aptitude for a rigorous studio practice

**Course Level Learning Outcomes**:

      On the completion of the course the students shall be able to:-
- Understand about the portrait from life and its transformation into composition
- Know about the opportunities to develop independent artistic thinking and aptitude for a rigorous studio practice
- Communicate the content, context and process the work visually

**Course Description**

Students shall work on portrait from Model of different age groups showing characteristics, vitality, resemblance, proportion, features etc.

**Assessment and Evaluation**

Internal Assessment-       \*Submission Work-   20%

External Assessment-     80%

**Terminal Examination**

**Time: 10 hours**

Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24 hours before the scheduled date of Examination.

<div align="center">

**Size-1/2 Imperial**
**Medium- Oil Colour ,Watercolour or Tempra**

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**\*Submission work:-**
The Submission work shall include the following:
 I. 5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
 II-The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour
 Sketches' of Human , Animal , Study of trees , Lanes , Human faces & Body parts etc.
III- The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the
commencement of Examination.

**Semester-III**
**Course- History and Philosophy of Modern Art –I**
**Code- FA-D&P-CC-301**

**Course Objectives:**
- To enable the students,develop a critical understanding of modern art and its various movements
- To  familiarize the students about role of cultural contexts in shaping the arts

**Course Level Learning Outcomes** :
On the completion of the course the students shall be able to:-
- Develop a critical understanding of History of Modern Art and its relevance and impact on art
- Develop an understanding of Modern Art Movements and its relevance and impact on art
- Learn that Cultural and Social contexts played vital role in shaping the arts

**Course Description:**

**Unit-I**
The turning point of Art in the 19th century, Neo-classism
**Unit-II**
Romanticism, Realism
**Unit-III**
Impressionism, Neo Impressionism
**Unit-IV**
Nabism , Post-Impressionist Painting
**Unit-V**
Favism, Cubism

**Assessment And Evaluation**
**Internal Assessment** –    Midterm Examination                                        10%
                             Term Paper                                                         10%
                             Students Participation and overall performance            5%
**External Assessment-**    **75%**
**Terminal Examination**
**Time: 3Hours**

 The Question paper shall contain three sections. Section A shall contain 10 questions two from each unit of
1.5 marks each. The candidate is required to answer all the questions.The answer should not exceed 50 words
each.Section B shall contain 5 questions one from each unit with internal choice. Each question shall be of 6
marks. The answer should not exceed 200 words each. The candidate is required to answer all the
questions.Section C shall contain 5 questions to 10 marks each, one from each unit. The candidate is required
to answer any three questions. The answer should not be more than 500 words each.

**Required Readings:**
- साखलकर, र.वी., *आधुनिक चित्रकला*, हिन्दी ग्रंथ अकादमी, जयपुर
- प्रताप रीता, *आधुनिक चित्रकला का इतिहास*, हिन्दी ग्रंथ अकादमी, जयपुर
- Cheney, Sheldon, *Story of Modern Art*,Viking books,1958

**Suggested Readings:**

- Phaidon , *Dictionary of 12 Century Art*, Dutton;2 dededition1977

- H.Bars Alfred, *Master of Modern Art*, Museum of Modern Art, NewYork

- Rewalot John, *History of Impressionism*  Museum of Modern Art,1973

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**Course- History of Western Art–I**
**Code- FA-D&P-CC-302**

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**Course Objectives:**

- To enable the students, develop a critical understanding of ancient art forms and its development
- To  familiarize the students the prominent art forms and its application part

**Course Level Learning Outcomes** :
On the completion of the course the students shall be able to:-
- Understand the basics of different art forms and concept of beauty and impact of art on human mind.
- Demonstrate artistic and aesthetic sensibilities
- Enhance multiple perspective and cultural and cross-cultural understanding through exploration of visual arts

**Course Description:**

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**Unit-I**
Pre-Historic Cave Paintings
**Unit-II**
Art of Egypt, Art of Crete and Mycenae
**Unit-III**
Greak  Art-Geometrical Period to Hellenistic Period
**Unit-IV**
Etruscan and Roman Art

**Unit-V**
Early Christian Art, Byzantine Art

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**Assessment And Evaluation**

| | | |
|---|---|---|
| **Internal Assessment –** Midterm Examination | 10% | |
| Term Paper | | 10% |
| Students Participation and overall performance | 5% | |

**External Assessment-**     **75%**
**Terminal Examination**
**Time: 3Hours**

The Question paper shall contain three sections. Section A shall contain 10 questions two from each unit of 1.5 marks each. The candidate is required to answer all the questions. The answer should not exceed 50 words each. Section B shall contain 5 questions one from each unit with internal choice. Each question shall be of 6marks. The answer should not exceed 200 words each. The candidate is required to answer all the questions. Section C shall contain 5 questions to 10 marks each, one from each unit. The candidate is required to answer any three questions. The answer should not be more than 500 words each.

**Required Readings:**

- अषोक,*पाष्चात्य कला*, संजय पब्लिकेषन, मेरठ
- चतुर्वेदी, ममता, *पाष्चात्य कला का इतिहास*, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर
- साखलकर र.वि.,*युरोपीय चित्रकला का इतिहास*, हिन्दी ग्रंथ अकादमी, जयपुर

**Suggested Readings:**

- Gombrich E.H., *The Story of Art*,Phaidon Press, 1950

- Kuhn.H., *The Rock Pictures of Europe*, FairLawn,1956

- Sowell Johnlay, *The History of Western Art*, Department of the History of Art and Architecture, Fall Term, University of Pittsburgh, 2001

- Levey Michaese, *A History o f Western Art*, Thames and Hudson,1968

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**Course -Composition(Figurative)**
**Code-FA-D&P-CE-303A**

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**Course objectives**:
- To enable the students, develop a critical and artistic temperament and use materials tools and processes from variety of media.

- To enable the students, develop independent artistic thinking and aptitude for a rigorous studio practice
- To know understanding of art theory by applying practical methodology to the task

**Course Level Learning Outcomes**:

On the completion of the course the students shall be able to:-
- Develop personal approach to visualization, conceptualization and art making
- Ability to explore diversity of conceptual and aesthetic approaches, styles and techniques.
- Create art work and write critiques about art after visiting museums, galleries, and artist studio

**Assessment and Evaluation**

Internal Assessment-          *Submission Work-    20%

External Assessment-       80%

**Terminal Examination**

**Time: 10 hours**

Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24 hours before the scheduled date of Examination..

**Size-1/2 Imperial**
**Medium- Charcoal, Graphite, Black ink**

**\*Submission work: -**

The Submission work shall include the following:
I.       5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
II.      The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human , Animal , Study of trees , Lanes , Human faces & Body parts etc.
III.     The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

**Course-Print Making (Leno)**
**Code-FA-D&P-CE-303B**

**Course objectives**:
- To familiarize students about basic techniques in relief printing Lino
- To familiarize the students about techniques of various print making

**Course Level Learning Outcomes**:

On the completion of the course the students shall be able to:-
- Understand about basic techniques in relief printing Lino
- know and identify about techniques of various print making

**Assessment and Evaluation**

Internal Assessment-          *Submission Work-    20%

External Assessment-       80%

**Terminal Examination**

**Time: 10 hours**

Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24 hours before the scheduled date of  Examination.

**Size-1/2 Imperial**
**Medium- Black ink**

**\*Submission work: -**

The Submission work shall include the following:
I.      5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
II.     The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human , Animal , Study of trees , Lanes , Human faces & Body parts etc.
III.    The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

**Course-Nature Study (Monochrome)**
**Code-FA-D&P-CE-304A**

**Course objectives**:

- To developed the sense of structure study, from any kind of forms in nature such as pots, plants, flowers insects, shells etc
- To understand how these forms achieve their structural unity through adherence to principles with physical nature of the material being observed and studied through various rendering media and techniques in various light conditions.
- To experience the method of using transparent colours by studying nature.

**Course Level Learning Outcomes**:

On the completion of the course the students shall be able to:-

- Develop the sense of observation in structure study, from any kind of forms in nature such as pots, plants, flowers insects, shells etc
- Demonstrate mastery of elements of designs
- Create a series of original work of art with conceptual and procedural clarity

**Assessment and Evaluation**

Internal Assessment-          *Submission Work-   20%

External Assessment-        80%

**Terminal Examination**

**Time: 10 hours**

Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24 hours before the scheduled date of  Examination.

**Size-1/2 Imperial**
**Medium- Charcoal, Graphite, Black ink**

**\*Submission Work:-**

The Submission work shall include the following:

I.      5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
II.     The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human , Animal , Study of trees , Lanes , Human faces & Body parts etc.
III.    III-     The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

**Course -Creative Still Life (Monochrome)**
**Code-FA-D&P-CE-304B**

**Course objectives**:

- To enable the student study the still life in monochrome
- To analysis of objects a line, from plane and light
- To familiarize the students transformation of objects into variety of simple and complex planes, tones and organization.

**Course Level Learning Outcomes**:

On the completion of the course the students shall be able to: -

- Apply Still life in Monochrome
- Analyse objects of line, from plane and light
- Apply transformation of the objects into variety of simple and complex planes, tones and organization

**Assessment and Evaluation**

Internal Assessment -          *Submission Work-20%

External Assessment -        80%

**Terminal Examination**

**Time  10 Hours**.

Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24 hours before the scheduled date of  Examination.

**Size-1/2 Imperial**
**Medium- Charcoal, Graphite, Black ink**

**\*Submission work:-**
The  Submission work shall include the following:
  I.    5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
  II.   The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human , Animal , Study of trees , Lanes , Human faces & Body parts etc.
  III.  The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

**Course – Life Study (Monochrome)**
**Code- FA-D&P-CC-304C**
**Course objectives**:
  • To enable the student, know about preparation of portrait from life and its transformation into composition
  • To familiarize the students about human anatomy and drawing
  • To enable student, understand about basic drawing skills-gesture, proportion, foreshortening and artistic anatomy
• **Course Level Learning Outcomes**:
      On the completion of the course the students shall be able to:-
  • Understand about the portrait from life and its transformation into composition
  • Demonstrate an ability to draw human figure through observation
  • Focus on different aspects and techniques of Model and Skelton
**Course Description**
Students shall work on portrait from Model of different age groups showing characteristics, vitality, resemblance, proportion, features etc.
**Assessment and Evaluation**

Internal Assessment-          \* Submission Work-   20%
External Assessment-        80%
**Terminal Examination**
**Time: 10 hours**
  Four session of 2.5 hours in two consecutive days. Two sittings every day with a break of  half an hour in between. The Examiner will send in instruction paper to the Head or coordinator Envelops opened 24 hours before scheduled date of   Examination.

**Size-1/2 Imperial**
**Medium- Charcoal, Graphite, Black ink**

**\*Submission work:-**
The Submission work shall include the following:
  I.    5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
  II.   The student will have to prepare a sketch book containing not less than 50 sketches. Paper, Pencil or Colour Sketches' of  Human , Animal, Study of trees, Lanes, Human faces & Body Parts etc.
  III.  The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

**Open Elective Courses**
**Course-2D Design (Monochrome)**
**Code-FA-D&P-OE-305A**
**Course objectives**:
      • To enable the students, know of various types of objects and compose them into flat a pictorial image.
      • To enable the students, develop understanding of interrelationship between different shapes and forms
      • To familiarize the students Handing of various types of materials for design organization 2D Design such as: Pencil & Pen
**Course Level Learning Outcomes:**

On the completion of the course the students shall be able to:-
- Learn about various types of objects and compose them into flat and pictorial image
- Understand the interrelationship between different shapes and forms
- Understand the handing of various types of materials for design organization 2D Design such as: Pencil & Pen

**Assessment and Evaluation**

Internal Assessment-     Submission Work-   20%
External Assessment-     80%

**Terminal Examination**

**Time: 10 hours**

Four sessions of  2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24 hours before the scheduled date of Examination.

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**Size-1/2 Imperial**
**Medium- Charcoal, Graphite, Black ink**

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**\*Submission work:-**

The Submission work shall include the following:
I.    5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
II.   The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human , Animal , Study of trees , Lanes , Human faces & Body parts etc.
III.  III- The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

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**Course: Rendering (Monochrome)**
**Code:FA-D&P-OE-305B**

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**Course objectives**:
- To  familiarize the students various types of objects their traits and draw them
- To develop the students understanding of interrelationship between different shapes and forms
- To understand the handing of various types of materials for design organization and rendering such as: Pencil & Pen

**Course Level Learning Outcomes** :

On the completion of the course the students shall be able to:-
- Study of various types of objects and apply them into flat or pictorial images
- Develop an Understanding of interrelationship between different shapes and forms
- Develop a handing of various types of materials for design organization and rendering such as: Pencil & Pen

**Assessment and Evaluation**

Internal Assessment-     Submission Work-   20%
External Assessment-     80%

**Terminal Examination**

**Time 10Hours.**

Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24 hours before the scheduled date of  Examination.

<div align="center">

**Size-1/2 Imperial**
**Medium- Charcoal, Graphite, Black ink**

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**\*Submission work: -**

The  Submission work shall include the following:
I.   5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
II.  The student will have to prepare a sketch book containing not less than 50 sketches. Paper, Pencil or Colour Sketches of Human, Animal, Study of trees, Lanes, Human faces & Body Parts etc.
III. The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

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**Semester-IV**

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## Course- History and Philosophy of Modern Art –II
## Code- FA-D&P-CC-401

**Course Objectives**
- To familiarize the student about the development of modern art
- To familiarize the students with the prominent artists and their seminal works
- To enable the student understand the nuances in the field of modern art

**Course Level Learning Outcomes** :

On the completion of the course the students shall be able to:-
- Develop a critical understanding of History of Modern Art and its relevance and impact on art and culture
- Develop a critical understanding of Modern Art Movements and its relevance and impact on Art, Culture and Society
- Apply nuances in their works

**Unit-I**
Expressionism, Constructivism
**Unit-II**
Other significant post cubistic movement
**Unit-III**
Metaphysical Painting, Dadaism
**Unit-IV**
Surrealism, Abstract Art
**Unit-V**
Significant Contemporary Movement

**Assessment and Evaluation**

**Internal Assessment** –    Midterm Examination                          10%

Term Paper                                                10%

Students Participation and overall performance     5%

**External Assessment-       75%**
**Terminal Examination**
**Time: 3Hours**

The Question paper shall contain three sections. Section A shall contain 10 questions two from each unit of 1.5 marks each. The candidate is required to answer all the questions. The answer should not exceed 50 words each. Section B shall contain 5 questions one from each unit with internal choice. Each question shall be of 6 marks. The answer should not exceed 200 words each. The candidate is required to answer all the questions. Section C shall contain 5 questions to 10 marks each, one from each unit. The candidate is required to answer any three questions. The answer should not be more than 500 words each.

**Required Readings**
- साखलकर, र.वी., *आधुनिक चित्रकला*, हिन्दी ग्रंथ अकादमी, जयपुर
- प्रताप रीता, *आधुनिक चित्रकला का इतिहास*, हिन्दी ग्रंथ अकादमी, जयपुर
- Cheney, Sheldon, *Story of Modern Art*,Viking books,1958

**Suggested Readings**

- Phaidon , *Dictionary of 12 Century Art*, Dutton;2 nd edition1977

- H.Bars Alfred, *Master of Modern Art* ,Museum of Modern Art, New York

- Rewalot John, *History of Impressionism,* Museum of Modern Art,197

## Course- History of Western Art–II
## Code- FA-D&P-CC-402

**Course Objectives**

- To enable the students, develop a critical understanding of Western art from the 18th century onwards
- To familiarize the students some of the prominent artists of the West and their artistic works
- To Introduce the students Modern Western Art

**Course Level Learning Outcomes** :

On the completion of the course the students shall be able to:-
- Develop a critical understanding of History of Western Art and its relevance and impact on art.
- Develop a critical understanding of Western Art Movements and its relevance and impact on art.
- Trace the development of Modern Western art from the 18[th]century to 20th century

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**Unit-I**
Romanesque  Art, Gothic Art
**Unit-II**
Early Renaissance period in Western Art
**Unit-III**
High Renaissance Period in Western Art
**Unit-IV**
Baroque Art-Classical, Baroque Art of France
**Unit-V**
British Painting Baroque Art, Rococo Art

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**Assessment and Evaluation**
**Internal Assessment** –     Midterm Examination                                    10%
                              Term Paper                                             10%
                              Students Participation and overall performance      5%
**External Assessment-         75%**
**Terminal Examination**
**Time: 3Hours**

The Question paper shall contain three sections. Section A shall contain10 questions two from each unit of 1.5marks each. The candidate is required to answer all the questions. The answer should not exceed 50words each. Section B shall contain 5questions one from each unit with internal choice. Each question shall be of 6 marks. The answer should not exceed 200 words each. The candidate is required to answer all the questions. Section C shall contain 5 questions to 10 marks each, one from each unit. The candidate is required to answer any three questions. The answer should not  be more than 500words each.

**Required Readings**
- अषोक,*पाष्चात्य कला*, संजय पब्लिकेषन, मेरठ
- चतुर्वेदी, ममता, *पाष्चात्य कला का इतिहास*, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर
- साखलकर र.वि.,*युरोपीय चित्रकला का इतिहास*, राजस्थान हिन्दी ग्रंथ अकादमी, जयपुर
- Gombrich E.H., *The Story of  Art*, PhaidonPress, 1950

**Suggested Readings**

- Kuhn. H., *The Rock Pictures of Europe*, FairLawn,1956

- Sowell Johnlay , *The History  of Western Art*, Department of the History of Art and Architecture, Fall Term, University of  Pittsburgh, 2001
- Levey  Michaese, *A History of Western Art*,ThamesandHudson,1968

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**Core Elective Courses**
**Course -Composition(Non-Figurative)**
**Code-FA-D&P-CE-403A**

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**Course objectives**:
- To enable the students, develop a critical and artistic temperament.
- To enable the students, develop independent artistic thinking and aptitude for a rigorous studio practice

**Course Level Learning Outcomes**:
        On the completion of the course the students shall be able to:-
- Develop personal approach to visualization, conceptualization and art making

- Develop an ability to explore diversity of conceptual and aesthetic approaches, styles and techniques

**Assessment and Evaluation**

Internal Assessment-          * Submission Work-   20%
External Assessment-       80%

**Terminal Examination**

**Time: 10 Hours**

Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24hoursbefore the scheduled date of Examination.

**Size-1/2 Imperial**
**Medium- Oil Colour ,Watercolour or Tempra**

**\*Submission work:-**

The Submission work shall include the following:
   I.   5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
   II.  The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human , Animal , Study of trees , Lanes , Human faces &Body parts etc.
   III. The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

**Course-Print Making (wood)**
**Code-FA-D&P-CE-403B**

**Course objectives**:
- To  familiarize the students, basic techniques in relief printing Lino
- To enable the students, know about techniques of various print making

**Course Level Learning Outcomes**:
   On the completion of the course the students shall be able to:-
- Understand about basic techniques in relief printing Lino
- Know and identify about techniques of various print making
- Apply various techniques in print making

**Assessment and Evaluation**

Internal Assessment-          * Submission Work-   20%
External Assessment-       80%

**Terminal Examination**

**Time: 10 Hours**

Four sessions of 2.5 hours in two consecutive  days. There shall be two sittings every day with a break of half an hour in between. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24 hours before the scheduled date of Examination

**Size-1/2 Imperial**
**Medium- Black ink**

**\*Submission work:-**

.The Submission work shall include the following:
   I.   5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
   II.  The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human , Animal , Study of trees , Lanes , Human faces &Body parts etc.
   III. The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

**Course-Nature Study (Coloured)**
**Code-FA-D&P-CE-404A**

**Course objectives**:
- To enable the students, develop a sense of structure study, from any kind of forms in nature such as pots, plants, flowers insects, shells etc
- To enable the students, understand 'how these forms achieve their structural unity through adherence to principles with physical nature of the material being'

- To familiarize the students, through various rendering media and techniques in various light conditions
- To enable the student experience the method of using transparent colours by studying nature

**Course Level Learning Outcomes**:

On the completion of the course the students shall be able to:-

- Develop the observation and the sense of structure study, from various kind of forms in nature such as pots, plants, flowers insects, shells etc
- Develop an understanding'how these forms achieve their structural unity through adherence to principles with physical nature'
- Apply rendering Media and Techniques

**Assessment and Evaluation**

Internal Assessment-          * Submission Work-    20%
External Assessment-        80%

**Terminal Examination**

**Time: 10 Hours**

Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour inbetween. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24hoursbefore the scheduled date of Examination.

<div align="center">

**Size-1/2 Imperial**
**Medium- Oil Colour ,Watercolour or Tempra**

</div>

**\*Submission work:-**

The Submission work shall include the following:
  I.    5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
  II.   The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human, Animal, Study of trees, Lanes, Human faces & Body Parts etc.
  III.  The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

<div align="center">

**Course -Creative Still Life (Coloured)**
**Code-FA-D&P-CE-404B**

</div>

**Course objectives**:

- To familiarize the students Still life in monochrome
- To  familiarize the student, analysis of objects a line, from plane and light
- To  enable the student transformation of the objects into variety of simple and complex planes, tones and organization.

**Course Level Learning Outcomes**:

On the completion of the course the students shall be able to:-

- Study of still life in monochrome
- Analyse  objects of  line, from plane , light and various shapes & dimensions
- Transform as the objects into verity of simple and complex planes, tones and organization in their drawings

**Assessment and Evaluation**

Internal Assessment-          * Submission Work-    20%
External Assessment-        80%

**Terminal Examination**

**Time: 10 Hours**

Four sessions of2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between.The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24 hours before the scheduled date of Examination.

<div align="center">

**Size-1/2 Imperial**
**Medium- Oil Colour ,Watercolour or Tempra**

</div>

**\*Submission work:-**

The Submission work shall include the following:
  I.    5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
  II.   The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human , Animal , Study of trees , Lanes , Human faces & Body parts etc.

III.  The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

**Course –Life Study (Coloured)**
**Code- FA-D&P-CC-404C**

**Course objectives**:
- To enable the students about preparation of portrait from life and its transformation into composition
- To understand the students Learn human anatomy and drawing
- To enable the students develop independent artistic thinking and aptitude for a rigorous studio practice

**Course Level Learning Outcomes**:
On the completion of the course the students shall be able to:-
- Understand about the portrait from life and its transformation into composition
- Know about the human anatomy and drawing
- Know about the opportunities to develop independent artistic thinking and aptitude for a rigorous studio practice

**Assessment and Evaluation**
Internal Assessment-          * Submission Work-   20%
External Assessment-       80%
**Terminal Examination**
**Time: 10 Hour**
Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between.The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24hoursbefore the scheduled date of Examination.

**Size-1/2 Imperial**
**Medium- Oil Colour ,Watercolour or Tempra**

**\*Submission work:-**
The Submission work shall include the following:
- I.  5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.
- II.  The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human , Animal , Study of trees , Lanes , Human faces & Body parts etc.
- III.  The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

**Open Elective Courses**
**Course-2D Design (Coloured)**
**Code-FA-D&P-OE-405A**

**Course objectives**:
- To enable the students study of various types of objects them into flat a pictorial image.
- To develop on understanding of interrelationship between different shapes and forms  Handing of various types of materials for design organization 2D Design such as: coloured

**Course Level Learning Outcomes**:
On the completion of the course the students shall be able to:-
- Study of various types of objects them into flat a pictorial image.
- Understand the  interrelationship between different shapes and forms
- To develop skills in handing of various types of materials for design organization 2D Design such as: coloured

**Assessment and Evaluation**
Internal Assessment-          * Submission Work-   20%
External Assessment-       80%
**Terminal Examination**
**Time: 10 Hours**
Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between. The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24hoursbefore the scheduled date of Examination.

**Size-1/2 Imperial**
**Medium- Oil Colour ,Watercolour or Tempra**

**\*Submission work:-**

The Submission work shall include the following:

I.       5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.

II.      The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human , Animal , Study of trees , Lanes , Human faces & Body parts etc.

III.     The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

**Course: Rendering (Coloured)**
**Code:FA-D&P-OE-405B**

**Course objectives**:

- •       To  enable the students various types of objects them into flat a pictorial image.
- •       To familiarize the students interrelationship between different shapes and forms
- •       To acquaint the students handing of various types of materials for design organization

**Course Level Learning Outcomes**:

On the completion of the course the students shall be able to:-

- •       Develop skills of various types of presentation and rendering
- •       Develop an understanding of interrelationship between different shapes and forms
- •       Apply handling of various types of materials for design organization and rendering such as coloured and pencil

**Assessment and Evaluation**

Internal Assessment-          \* Submission Work-    20%
External Assessment-       80%

**Terminal Examination**
**Time: 10 Hours**

Four sessions of 2.5 hours in two consecutive days. There shall be two sittings every day with a break of half an hour in between.The Examiner will send instruction paper to the Head or coordinator. Envelops shall be opened 24hoursbefore the scheduled date of Examination.

**Size-1/2 Imperial**
**Medium- Oil Colour ,Watercolour or Tempra**

.**Submission work:-**

The Submission work shall include the following:

I.       5 Sheets will be offered to each candidate and he/she will execute the task given in the prescribed medium.

II.      The student will have to prepare a sketch book containing not less than 50 sketches. Paper , Pencil or Colour Sketches' of Human, Animal, Study of trees, Lanes, Human faces & Body parts etc.

III.     The files of the above-mentioned tasks are to be submitted to the department at least 15 days before the commencement of Examination.

**Blended Learning**

Blended Learning is a pedagogical approach that combines face-to-face classroom methods with computer-mediated activities in the process of teaching and learning. It has been decided that blended learning be taken recourse to only if such need arises (unfortunately). To face such a situation, the teacher be kept in a ready to use mode. Hence, only 10% teaching be done through blended learning after deliberations of the departmental level.

**Keywords**

- ❖  LOCF
- ❖  NEP-2020
- ❖  Blended Learning
- ❖  Face to face (F to F) Learning
- ❖  Programme Outcomes

- ❖ Programme Specific Outcomes
- ❖ Course-level Learning Outcomes
- ❖ Postgraduate Attributes
- ❖ Learning Outcome Index
- ❖ Formative Assessment and Evaluation
- ❖ Comprehensive and Continuous Evaluation

**References**

- ❖ National Education Policy-2020.
  https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

- ❖ The draft subject specific LOCF templates available on UGC website.
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  Draft Blended Mode of Teaching and Learning: Concept Note available on UGC website.
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# M. G. S. UNIVERISTY, BIKANER

# SYLLABUS

**M.Sc. Microbiology**

(Semester System)

Session-2021-22

# Maharaja Ganga Singh University

# Bikaner

# Curriculum Framework

## M.Sc. Microbiology

## Department of Microbiology

## Faculty of Science

## 2021-2022

**Table of Contents**

**Background**

Considering the curricular reforms as instrumental for desired learning outcomes, all academic departments of Maharaja Ganga Singh University made a rigorous attempt to revise the curriculum of postgraduate programmes in alignment with National Education Policy-2020 and UGC Quality Mandate for Higher Education Institutions-2021. The process of revising the curriculum could be prompted with the adoption of "Comprehensive Roadmap for Implementation of NEP". The Roadmap identified the key features of the Policy and elucidated the Action Plan with well-defined responsibilities and indicative timeline for major academic reforms.

The process of revamping the curriculum started with the series of webinars and discussions conducted by the University to orient the teachers about the key features of the Policy, enabling them to revise the curriculum in sync with the Policy. Proper orientation of the faculty about the vision and provisions of NEP-2020 made it easier for them to appreciate and incorporate the vital aspects of the Policy in the revised curriculum focusing on creating holistic, thoughtful, creative and well-rounded individuals equipped with the key 21st century skills 'for the development of an enlightened, socially conscious, knowledgeable, and skilled nation'.

With NEP-2020 in background, the revised curricula articulate the spirit of the Policy by emphasizing upon- integrated approach to learning; innovative pedagogies and assessment strategies; multidisciplinary and cross-disciplinary education; creative and critical thinking; ethical and Constitutional values through value-based courses; 21st century capabilities across the range of disciplines through life skills, entrepreneurial and professional skills; community and constructive public engagement; social, moral and environmental awareness; Organic Living and Global Citizenship Education (GCED); holistic, inquiry-based, discovery-based, discussion-based, and analysis-based learning; exposure to Indian knowledge system, cultural traditions and classical literature through relevant courses offering 'Knowledge of India'; fine blend of modern pedagogies with indigenous and traditional ways of learning; flexibility in course choices; student-centric participatory learning; imaginative and flexible curricular structures to enable creative combination of disciplines for study; offering multiple entry and exit points, alignment of Vocational courses with the International Standard Classification of Occupations maintained by the International Labour Organization; breaking the silos of disciplines; integration of extra-curricular and curricular aspects; exploring internships with local industry, businesses, artists and crafts persons; closer collaborations between industry and higher education institutions for technical, vocational and science programmes; and formative assessment tools to be aligned with the learning outcomes, capabilities, and dispositions as specified for each course. The University has also developed consensus on adoption of Blended Learning with 10% component of online teaching and 90% face to face classes for each programme.

The revised curricula of various programmes could be devised with concerted efforts of the Faculty, Heads of the Departments and Deans of Schools of Study. The draft prepared by each department was discussed in series of discussion sessions conducted at Department, Faculty and the University level. The leadership of the University has been a driving force behind the entire exercise of developing the uniform template and structure for the revised curriculum. The Vice Chancellor of the University conducted series of meetings with Heads and Deans to deliberate upon the vital parameters of the revised curriculum to formulate a uniform template featuring Background, Programme Outcomes, Programme Specific Outcomes, Postgraduate Attributes, Structure of

Masters Course, Learning Outcome Index, Semester-wise Courses and Credit Distribution, Course-level Learning Outcomes, Teaching-Learning Process, Blended Learning, Assessment and Evaluation, Keywords, References and Appendices. The experts of various Boards of Studies and Faculties contributed to a large extent in giving the final shape to the revised curriculum of each programme.

*To ensure the implementation of curricular reforms envisioned in NEP-2020, the University has decided to implement various provisions in a phased manner. Therefore, the curriculum may be reviewed annually so as to gradually include all relevant provisions of NEP-2020.*

### Programme Outcomes (PO)

On completing Masters in the Faculty of Arts, the students shall be able to realise the following outcomes:

| PO | Description |
|------|-------------|
| PO1 | Understand the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevance in day-to-day life. |
| PO2 | Acquire the skills in planning and performing and handling scientific instruments during laboratory experiments |
| PO3 | Realize how developments in one science subject help in the development of other science subjects and vice-versa. |
| PO4 | Able to think creatively (divergently and convergent) to propose novel ideas in explaining facts and figures or providing new solutions to the problems. |
| PO5 | Learn how an interdisciplinary approach helps in providing better solutions and new ideas for sustainable development. |
| PO6 | Develop scientific outlook not only with respect to science subjects but also in all aspects of life. |
| PO7 | Understand the knowledge of subjects in other faculties that can greatly and effectively influence the evolving new scientific theories and inventions. |
| PO8 | Imbibe ethical, moral and social values in personal and social life |
| PO9 | Develop various communication skills which we will help in expressing ideas and views clearly and effectively. |
| PO10 | Analyse the given scientific data critically and systematically and the ability to draw the objective conclusions. |

| PO11 | The skills of observations and drawing logical inferences from scientific experiments. |
|------|------|
| PO 12 | Develop an overall personality by making them participate in various social and cultural activities voluntarily. |
| PO 13 | Prepare for employment in chosen field |
| PO 14 | Ability to think logically and creatively, and to solve scientific problems |
| PO 15 | Equipped to take up a suitable position in academia or industry or Institutions and to pursue a career in research. |

**Programme Specific Outcomes (PSO)**

On completing M.Sc. Microbiology Programme, the students shall be able to realise following outcomes:

| PSO 1 | Shall be able to design and execute experiments related to Basic Microbiology, Molecular Biology, Immunology, Recombinant DNA Technology, Biochemistry, Environment, Agriculture, Medical, Industrial, Food Microbiology. |
|-------|------|
| PSO 2 | Shall be able to perform minor research projects incorporating techniques of Basic and Advanced Microbiology. The learners will be equipped to take up a suitable position in academia or industry or Institutions and to pursue a career in research if so desired. |
| PSO 3 | Shall be able to compete in national level competitive exams such as NET-JRF or GATE or International exams and can pursue career in higher studies |
| PSO 4 | Shall practice safe microbiology, using appropriate protective, biosafety and emergency procedures. |
| PSO 5 | Shall have in-depth theoretical and practical knowledge of huge diversity of microorganisms, their metabolism & physiology, concepts of molecular genetics and genetic engineering, biosynthetic pathways, enzymology, microbial pathogenicity, role of microbes in food, agriculture and environment, health and disease. |

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| PSO 6 | Shall be able to apply the scientific method and hypothesis testing in the design and execution of experiments including the understanding of theoretical background, hypothesis generation, collection and analysis of data, and interpretation and presentation of results. |
|---|---|
| PSO 7 | Shall be able to communicate scientific results to the general public and experts by writing well-structured reports and contributions for scientific publications and posters, and by oral presentations |

**Post Graduate Attributes**

The Post graduate attributes of our students shall be aligned with those of our University in terms of touching "the life of every student through inculcating virtues of empathy, ethics, efficiency, respect for diversity, prudence and creativity with compassion". We wish to achieve this through rigorous teachings and research efforts, which remains the basic tenet of our teaching-learning philosophy. The following are the Post graduate attributes of the subject:

- Broaden the outlook and attitude, develop the current skills and abilities, learn new one to excel in studies and career, grow into responsible global citizens.
- Contour the academic career of the students, make them employable, enhance research acumen and encourage the participation in co-curricular and extracurricular activities.
- Instill skills and abilities to develop a positive approach and be self-contained to shape one's life and also that of colleagues and peers.
- Demonstrate behavioral attributes for the enhancement of soft skills, socialistic approach and leadership qualities for successful career and nurture responsible human being.
- Provide highly skilled and knowledgeable human resources for agricultural sector, food industry, dairy industry, medical and paramedical field, environment management, space research and research institutes.

## Structure of Programme

| Paper Code | Paper Name | | Lecture | Tutorial | Practical | Total Credits | Maximum Marks | | Minimum Passing Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Internal Marks | External Marks | |
| **Semester-I** | | | | | | | | | |
| **Theory Papers** | | | | | | | | | |
| FS-MIC-CC-101 | General Microbiology and Bacteriology | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-MIC-CC-102 | Microbial Physiology and Biochemistry | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-MIC-CC-103 | Molecular Biology | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-MIC-CC-104 | Microbial Genetics and Genetic Engineering | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| #FS-MIC-CF-100 | Introduction to Microbiology | Core Foundation | 2 | 2 | 1 | 5 | 50 | -- | 18 (36%) |
| | | | | | | | 40 | 160 | |
| #Audit course. The candidate will have to qualify the paper by the time He / She qualifies for the Programme. He/She can avail maximum 4 chances along with the Semester Examinations. | | | | | | | Total Theory Marks | 200 | 72 (36% aggregate) |
| **Practical** | | | | | | | | | |
| Combined Practical (5 Credit) (Based on theory papers) | | | | | | | 25 | 75 | 36 (36% aggregate) |
| | | | Total Credits | | | 25 | Grand Total | 300 | |
| **Semester-II** | | | | | | | | | |
| **Theory Papers** | | | | | | | | | |
| FS-MIC-CC-201 | Virology | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-MIC-CC-202 | Bioinstrumentation | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-MIC-CC-203 | Eukaryotic Microbiology | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-MIC-CC-204 | Industrial and food Microbiology | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |

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| Code | Title | Category | | | | | | | | |
|------|-------|----------|---|---|---|---|---|---|---|---|
| #FS-MIC-CF-200 | National and Human Values | Core Foundation | 2 | 2 | 1 | 5 | 50 | -- | |
| | | | | | | | 40 | 160 | |
| #Audit course. The candidate will have to qualify the paper by the time He / She qualifies for the Programme. He/She can avail maximum 3 chances along with the Semester Examinations. | | | | | | | Total Theory Marks | 200 | 72 (36% aggregate) |

**Practical**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Combined Practical (5 Credit) (Based on theory papers) | | | | | | | 25 | 75 | 36 (36% aggregate) |
| | | | | | **Total Credits** | **25** | **Grand Total** | **300** | |

**Semester-III**

**Theory Papers**

| Code | Title | Category | | | | | | | |
|------|-------|----------|---|---|---|---|---|---|---|
| FS-MIC-CC-301 | Immunology | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-MIC-CC-302 | Soil and Agricultural Microbiology | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-MIC-CE-303(A)  FS-MIC-CE-303(B) | Medical Microbiology **OR** Food and Dairy Microbiology | Core Elective | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-MIC-OE-304(A)  FS-MIC-OE-304(B) | Human Physiology **OR** Basics of Medical Lab Technology | Open Elective | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| | | | | | | | 40 | 160 | |
| | | | | | | | Total Theory Marks | 200 | 72 (36% aggregate) |

**Practical**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Combined Practical (4 Credit) (Based on theory papers) | | | | | | | 25 | 75 | 36 (36% aggregate) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | **Total Credits** | **20** | **Grand Total** | **300** | |
| | | | | | | | | | |
| | | | | **Semester-IV** | | | | |
| FS-MIC-CC-401 | Bioinformatics and Computer Applications | Core Compulsory | 2 | 1 | 2 | 5 | 10 | 40 | 13 (25 %) |
| FS-MIC-CC-402 | Microbial Ecology and Environmental Biotechnology | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 36 (25 %) |
| FS-MIC-CE-403(A) FS-MIC-CE-403(B) | Research Project OR Review | Core Elective | 0 | 0 | 0 | 5# | 10 | 40 | |
| FS-MIC-OE-404(A) FS-MIC-OE-404(B) | Biostatistics OR Microorganisms and Health | Open Elective | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| | | | | | | | | | |
| | | **\*10 min presentation/viva voce of each student** | | | | | | 40 | 160 |
| | | | | | | | Total Theory Marks | 200 | 72 (36% aggregate) |
| | | | | **Practical** | | | | | |
| Combined Practical  (4 Credit) (Based on theory papers) | | | | | | | 25 | 75 | 36 (36% aggregate) |
| | | | | | **Total Credits** | **20** | **Grand Total** | **300** | |

# Teacher guide shall decide the hrs required for carrying out the decided Research Project/ Review/Case Study by the allotted student(s) in the forms of lecture, tutorial and lab work as per the requirement of the study topic.

**Learning Outcome Index**

I.     **Programme Outcomes (PO) and Programme Specific Outcomes (PSO)**

| PO | PSO-1 | PSO-2 | PSO-3 | PSO-4 | PSO-5 | PSO-6 | PSO-7 |
|---|---|---|---|---|---|---|---|
| PO-1 | X | X | X | X | X | X | X |
| PO-2 | X | X | X | X | X | X | X |
| PO-3 | X | X | X | X | X | X | X |
| PO-4 | X | X | X | X | X | X | X |
| PO-5 | X | X | X | X | X | X | X |
| PO-6 | X | X | X | X | X | X | X |
| PO-7 | X | X | X | X | X | X | X |
| PO-8 | X | X | X | X | X | X | X |
| PO-9 | X | X | X | X | X | X | X |
| PO-10 | X | X | X | X | X | X | X |
| PO-11 | X | X | X | X | X | X | X |
| PO-12 | X | X | X | X | X | X | X |
| PO-13 | X | X | X | X | X | X | X |
| PO-14 | X | X | X | X | X | X | X |
| PO-15 | X | X | X | X | X | X | X |

## II. Core Courses (CC):

| PSO | CC-1 | CC-2 | CC-3 | CC-4 | CC-5 | CC-6 | CC-7 | CC-8 | CC-9 | CC-10 | CC |
|-----|------|------|------|------|------|------|------|------|------|-------|-----|
| PSO-1 | X |  | X | X | X | X |  | X | X | X | X |
| PSO-2 |  | X | X |  | X | X | X | X |  | X | X |
| PSO-3 | X |  | X | X |  | X | X | X | X |  | X |
| PSO-4 | X | X | X | X | X | X | X |  | X | X | X |
| PSO-5 | X | X | X | X | X |  | X | X | X |  | X |
| PSO-6 | X | X | X |  | X | X | X |  | X | X | X |
| PSO-7 | X | X | X |  | X | X | X | X | X |  | X |

## III. Elective Courses (EC):

| PSO | FSMBCE-303A | FSMBCE-303B | FSMBEO-304A | FSMBEO-304B | FSMBCE-403A | FSMBCE-403B | FSMBEO-403A | FSMBEO-403B |
|-----|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| PSO-1 | X | X | X |  | X | X | X |  |
| PSO-2 | X |  | X | X |  | X | X | X |
| PSO-3 |  | X | X | X | X | X |  | X |
| PSO-4 | X | X | X | X | X |  | X | X |
| PSO-5 | X | X |  | X | X | X |  | X |
| PSO-6 | X |  | X | X |  | X | X |  |
| PSO-7 | X | X | X |  | X | X |  | X |

## M.Sc. MICROBIOLOGY (Semester System)

### ELIGIBILITY

Looking at the interdisciplinary nature of Microbiology, the eligibility of candidates for admission to M.Sc. Microbiology shall be as given below:

Bachelor Degree with one of the subject of Life sciences i.e. Botany/Zoology/Microbiology/Biotechnology/Biochemistry/Genetics/Medicine/BDS/Agriculture /Pharmacy/Life Sciences with 50% marks.

### M.Sc. Microbiology Programme Details:
### Semester 1
### Marking Scheme for External Exam

| Theory Papers | Duration | Max. Marks |
|---------------|----------|------------|
| FS-MIC-CC-101 | 3 Hrs. | 40 |
| FS-MIC-CC-102 | 3 Hrs. | 40 |
| FS-MIC-CC-103 | 3 Hrs. | 40 |
| FS-MIC-CC-104 | 3Hrs. | 40 |

| | | |
|---|---|---|
| Combined Practical | 1 Day (6Hrs) | 75 |
| Academic/Industrial Tour | 1-5 Days | 00 |

### FS-MIC-CC-101: General Microbiology and Bacteriology
### Course Objectives:

The course objectives are to provide knowledge on: landmark discoveries and contribution of several Microbiologists in the field of Microbiology, different domains classification, familiarity with the bacterial taxonomy and their conventional and molecular characterization using modern methods, knowledge of their cultivation and growth requirement, life cycles of important groups of bacteria.

### Course Level Learning Outcomes:

Upon successful completion of the course, students will have the knowledge and skills to:

| CO1 | Explain the key concepts in Microbiology and Bacteriology. Students will get the basics and understand the importance of Microbiology. |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------|
| CO2 | Students will be acquainted with the concept of prokaryotes, their taxonomy, and differentiation from eukaryotes. They will understand how Microbiology developed and what is the scope of the various branches of the subject. |

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| CO3 | Students will be acquainted with the microbial structure and function and study the comparative characteristics of prokaryotes and eukaryotes and also understand the structural similarities and differences among various physiological groups of eubacteria/archaea. |
|------|------|
| CO4 | Students will be able to define and state the principles of various techniques used in microbiology. The course will enable them to understand staining techniques, CFU count and characterization of microbes etc. The students will know various culture media and their applications and also understand various physical and chemical means of sterilization. |
| CO5 | At the end of the course, Bacteriology will provide the better understanding of bacteria and their characteristics in terms of identification, classification, growth and reproduction etc. |
| CO6 | Through the course the students will learn the methods, requirements to grow different type of microorganisms, various physical and chemical growth requirements of bacteria and get equipped with various methods of bacterial growth measurement. |
| CO7 | Students will be able to understand the concept of taxonomy and summarize them with the help of polyphasic taxonomy, numerical taxonomy etc and they will also be able to describe the importance of genetic analysis in taxonomy. |
| CO8 | At the end of the course, the student will be able to describe genomic based methods to study microbial diversity in nature, the mechanisms behind it and general characteristics of important bacteria. |

## Course Description
### UNIT-I
Scope of Microbiology, Culturable and unculturable bacteria. Microbial Taxonomy: Taxonomic ranks, Phenetic and Phylogenetic classification approaches, Numerical taxonomy and Polyphasic classification approaches, Major groups of bacteria according to Bergey's manual of systematic bacteriology. Ultra structure, chemistry and function of prokaryotic cells.

### UNIT-II
Autotrophs, heterotrophs, lithotrophs, chemotrophs and phototrophs. Microbial Growth: Growth factors, Growth curve, kinetics, synchronous growth of bacteria. Control of Microorganisms: Sterilization; Dry, Wet, Chemical, Filtration, Radiation. Evaluation of effectiveness of physical and chemical antimicrobial agents. Media preparations, types of media. Differential, Selective and enrichment media. Aerobic and Anaerobic cultivation.

### UNIT-III
General Characters of Important Bacteria- *Escherichia, Salmonella, Vibrio, Proteus, Bacillus, Lactobacillus, Streptococcus, Staphylococcus, Corynebacterium, Treponema, Mycobacterium, Pseudomonas, Klebsiella, Thiobacillus, Rhizobium, Azotobacter, Acetobacter, Streptomyces, Clostridium.*
Characters of Special groups of organisms as- Archaebacteria, Photosynthetic bacteria, Nitrogen fixing bacteria, Spirochaetes, Mycoplasma, Rickettsia, Bdellovibrio.

## Scheme of Examination
**Maximum Marks: 50 (40 External + 10 Internal)**                **Duration: 3 Hrs**
**Minimum Passing Marks:        13**
**External**
The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).
**Internal**
Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).
**REQUIRED READINGS:**
1.        General Microbiology (5th edition) by Stanier Ingraham Wheelis, Macmillan; 2007.
2.        Prescott/Harley/Klein's Microbiology by Willey J., Sherwood L. and Woolverton C. McGraw Hill;2007.

3.      Microbiology A laboratory manual by Cappuccino, G. .James, Sherman Natalie, Pearson Education; 2011.
4.      Microbiology by Pelczar J. Michael, Chan E.C.S, Krieg R. Noel, Tata McGraw-Hill Publishing Company Limited, 1998.
5.      The Prokaryotes. A handbook on the biology of bacteria: ecophysiology, isolation, identification, applications. Volumes I-IV by Balows, A., Truper, H. G., Dworkin, M., Harder, W., Schleifer, K. H. Springer-Verlag, New York; 1992.
6.      Principles of Microbiology by R.M. Atlas, Mosby publishers, St. Louis; 1995.
7.      Brock Biology of Microorganisms (12th edition) by Madigan and John M. Martinko, Paul V. Dunlap, David P. Clark Benjamin Cummings; 2008.
8.      Microbiology: An Introduction by Gerard J., Tortora, Berdell R. Funke, Christine L Case Benjamin-Cummings Publishing Company; 2008.

**RECOMMEDED READINGS**
9.      Bacterial Systematics, by Logan, A., Niall A. Logan, Wiley-Blackwell; 1994.
10.     Bergey's Manual of Determinative Bacteriology (8th edition) by Breed and Buchanan; 1974.
11.     Bergey's Manual of Determinative Bacteriology (9th edition) by Breed and Buchanan; 1982.
12.     Bergey's Manual of Systematic Bacteriology (2nd edition) by Breed and Buchanan. (Volumes. 1 – 5); 2001- 2003.

### FS-MIC-CC-102: Microbial Physiology and Biochemistry
### Course Objectives:
This course deals with characteristics, properties and biological significance of the biomolecules of life. In depth knowledge of the energetic and regulation of different metabolic processes in microorganisms.
### Course Level Learning Outcomes:
Upon successful completion of the course, the learner will be able to :

| | |
|---|---|
| **CO1** | Conceptual knowledge about growth and physiology of microorganisms with respect to various physical and chemical requirements of microbes and get equipped with various methods of their growth measurement. |
| **CO2** | The students will understand different microbial transport systems and their importance in microbial physiology. |
| **CO3** | Conceptual knowledge of properties, structure, function of enzymes, enzyme kinetics and their regulation ,enzyme engineering, Application of enzymes in large scale industrial processes |
| **CO4** | Understanding the laws of thermodynamics , concepts of entropy, enthalpy and free energy changes and their application to biological systems and various biochemical studies and reactions. |
| **CO5** | Conceptual knowledge of aerobic and anaerobic respiration and various intermediary mechanisms involved, oxidative phosphorylation |
| **CO6** | Overview of major biomolecules –carbohydrates, lipids, proteins, amino acids, nucleic acids, classification, structure, function of the above mentioned biomolecules |
| **CO7** | Discuss the biosynthesis and the degradation pathways involved. |

1.
### Course Description

## UNIT-I

Microbial growth: definition of growth, growth curve; The mathematics of growth-generation time, specific growth rate, batch and continuous culture. Temperature -temperature ranges for microbial growth. pH- pH ranges for microbial growth. Microbial transport **:** diffusion – Passive and facilitated, Primary active and secondary active transport, Group translocation (phosphotransferase system), symport, antiport and uniport (Ritika Agarwal).

Structure of atom, molecules and chemical bonds. Biochemistry of enzymes: classification, nomenclature, specificity, isolation and purification. Enzyme kinetics and inhibition. Co-enzymes. Allosteric and other regulations of enzyme activity, Mechanism of action of enzymes.

## UNIT-II

Cell metabolism: anabolic principles and synthesis of fatty acids, lipids (Poorvi Vyas), amino acids and proteins in microbes (Ravi Prakash). Studies of biosynthesis of hormones. Synthesis of vitamins and their role as coenzymes (Rekha Vaishnav). Basic aspects of bioenergetics, entropy and enthalpy. Electron carriers, artificial electron donors, inhibitors, uncouplers, energy bonds and phosphorylation (Prabha Sankhla). Brief account of photosynthetic and accessory pigments (Priya Mundhra). Autotrophic generation of ATP and Fixation of $CO_2$ in Microorganism, Calvin cycle (Priyanshi Panwar). Oxygenic and anoxygenic photosynthesis (Pryyanka).

## UNIT-III

Microbial Oxidation of Inorganic Molecules: sulphur, iron, hydrogen and nitrogen (Monika Verma). Bioluminescence.

Catabolism of carbohydrates, proteins and lipids; Respiratory pathways: Embden Mayer Hoff Parnas pathway, EntnerDoudroff pathway, Glyoxalate pathway, Krebs cycle, oxidative and substrate level phosphorylation, Reverse TCA cycle, Gluconeogenesis, Pasture effect; Fermentation of carbohydrates: homo and heterolactic fermentations.

## Scheme of Examination

**Maximum Marks: 50 (40 External + 10 Internal)**                    **Duration: 3 Hrs**
**Minimum Passing Marks:        13**

**External**
The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**
Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**
1. Biochemistry by Geoffrey L. Zubay. Fourth Edition, Addison-Wesley educational publishers Inc.,2008.
2. Lehninger: Principles of Biochemistry by David L. Nelson and Michael M. Cox.Fifth Edition, W.H.Freeman and Company; 2008.
3. Biochemistry, (2nd edition) by Voet Donald & Voet Judith G.,John Wiley & sons New York; 1995.
4. Physiology and Biochemistry of Prokaryotes(2nd edition) byWhiteDavid,Oxford University Press, NY;2000.

**RECOMMENDED READINGS:**
1.   Microbial lipids edited by C. Ratledge and SG Wilkinson, second edition, Academic Press; 1988.
2.   Microbial Physiology by Albert G. Moat and John W. Foster. (3rd edition), John Wiley and Sons;2002
3.   The Physiology and Biochemistry of Prokaryotes by David White. (2nd edition), Oxford UniversityPress; 2000.
2.   Biochemistry by Berg Jeremy, Tymoczko John, StryerLubert 6th Edition, W. H. Freeman, New York.(2001)

## FS-MIC-CC-103: Molecular Biology
### Course Objectives:

The purpose of this course is to introduce the student to the basic and advanced concepts in molecular biology. Learner will gain an understanding of molecular mechanisms of prokaryotic and eukaryotic DNA Structure, DNA Kinetics, DNA replication, DNA repair, transcription, translation, Transposition, Antitermination, Global regulatory responses and gene regulation. The student will study the techniques and experiments used to understand these mechanisms.

### Course Level Learning Outcomes:

Upon successful completion of the course, the learner will be able to :

| CO1 | Describe structure of DNA and RNA, organization of genome |
|---|---|

| CO2 | Compare the mechanisms of bacterial and eukaryotic DNA Replication |
|-----|------------------------------------------------------------------------|
| CO3 | Explain concepts in DNA repair mechanisms, and recombination as a molecular biology tool. |
| CO4 | Explain various levels of gene regulation in both prokaryotic and eukaryotic organisms |
| CO5 | Describe Transcription and post-transcriptional Processes |
| CO6 | Describe translation mechanism in prokaryotes and eukaryotes, regulation of translation, and post-translational processing |
| CO7 | Describe mechanism of gene regulation, Antitermination. |

## Course Description
### UNIT-I

Genetic Material : Chemical composition and organization, 3-D structure of DNA, linking number, topological properties, super coiling of DNA, packaging of DNA in pro & eukaryotes. DNA denaturation and renaturation, Coding and non-coding DNA, repetitive DNA sequences, DNA replication and repair mechanism: comparison between prokaryotes and eukaryotes, inhibitors of DNA replication, DNA damage, DNA recombination. Transposons and mechanism of transposition.

### UNIT-II

Transcription in pro and eukaryotes, Reverse transcription, inhibitors of transcription, post transcriptional processing. Translation in pro- and eukaryotes, Genetic code. Inhibitors of translation, post translational modifications.

### UNIT-III

Mechanism of gene regulation, catabolite repression, Lac and tryptophan operon, ara operon, cis-acting elements, transacting factors, positive and negative regulation, inducers and co-repressors. Negative regulation; regulation by attenuation. Antitermination - Proteins pN, pQ and nut sites,DNA binding sites, Global regulatory responses: heat shock response, stringent response and regulation by small molecules such as ppGpp(p) and cAMP.

### Scheme of Examination

**Maximum Marks: 50 (40 External + 10 Internal)**                          **Duration: 3 Hrs**
**Minimum Passing Marks:          13**

**External**
The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**
Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**
1. Gene IX by Benjamin Lewin, Jones and Bartlett Publishers, Sudbury, Massachusetts, 2007.
2. Molecular Biology by R.F. Weaver , 4th edition, McGraw Hill. New York. USA, 2007.

3. Molecular Biology of the Gene by J.D. Watson, T.A. Baker, S.P. Bell, A. Gann, M. Levin, R. Losick, 6th edition, Benjamin Cummings, San Francisco, USA, 2007.
4. Molecular Biology of the Cell by B. Alberts, A. Johnson, J. Lewis, M. Raff, K. Roberts, P. Walter, 5th edition, Garland Science, New York and London, 2007.

**RECOMMEDED READINGS:**
1. Biochemistry (5th edition) by J.M. Berg, J.L. Tymoczko, L. Stryer, W.H. Freeman and Company, New York, USA, 2008.
2. 6. Current Protocols in Molecular Biology Edited by: Fred M. Ausubel; Roger Brent; Robert E. Kingston; David D. Moore; John A. Smith; Kevin Struhl, John Wiley and Sons, Inc. 2007

### FS-MIC-CC-104: Microbial Genetics and Genetic Engineering
#### Course Objectives:
The course objectives are to provide an understanding of the genetic constituents of bacteria with special emphasis on various approaches and methods of genetic engineering and their applications.
#### Course Level Learning Outcomes:
Upon successful completion of the course, students will have the knowledge and skills to:

| | |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CO1  | Explain the key concepts of extra chromosomal DNA, plasmid types, classic Luria Delbruck experiment, mutations, and mechanisms of genetic exchange. |
| CO2  | The course teaches students with various approaches of genetic engineering and their applications in biological research as well as in biotechnology industries. |
| CO3  | The course will help the students to appreciate the concepts of gene and relationship between genotype and phenotype. They will gain knowledge in gene concepts, gene expression, and gene regulation and also learn about mutation types. |
| CO4  | Through completion the course the students will acquire the knowledge about different methods in molecular cloning, DNA amplification, DNA sequencing, construction and screening of genomic and cDNA libraries and its applications. |
| CO5  | By the end of study in this course, the student will be able to understand nucleic acid hybridization techniques, restriction mapping and gel electrophoresis. |
| CO6  | On successful completion of the subject the student will learn the gene transfer technologies, expression systems and methods of selection. |
| CO7  | After the course students will be able to discuss the characteristics of various types of cloning vectors, restriction analysis, differentiate cloning vector and expression vector, and describe blue/white and red/white screening, antibiotic selection methods of cloning, and various DNA fingerprinting techniques. |

| CO8 | Through the course students will be able to discuss various DNA modifying enzymes used in genetic engineering. Students will learn to perform PCR assays and explain the application of modern biotechnological tools in cutting-edge research. They will be able to review the various applications of genetic engineering. |
|---|---|

## Course Description
### UNIT-I

Bacterial genome, Plasmids: Structure, classification, copy control, incompatibility, F-factor, col and R plasmids. Gene transfer in bacteria: Transformation, transduction, conjugation (F+, F- and Hfr cells), Genetic map, Genetic mapping of *E. coli*. Mutation *versus* adaptation, Luria Delbruck experiment and significance, Mutagenesis: Spontaneous and induced mutations, deletions, insertion and point mutations, physico-chemical agents of mutation, mutant selection.

### UNIT-II

Nucleic Acid Hybridization: Southern, Northern, Western Blotting, DNA fingerprinting, Foot printing, Gel retardation assay, Restriction endonucleases, Restriction mapping, Polymerase chain reaction, Gel electrophoresis (DNA, RNA and Protein).
DNA and RNA sequencing, (16S-23S rRNA), DNA Probes and their applications, RFLP, RAPD, AFLP, Use of microarrays to study gene expression.

### UNIT-III

Genetic Engineering: Plasmids pBR322, PUC18, phagemids, cosmids, BAC, YAC, Expression vectors, Enzymes (Ligases, topoisomerases, Gyrase, Nuclease), Cloning vehicles, Gene transfer techniques: chemical, electroporation, microinjection, particle bombardment, *Agrobacterium* mediated gene transfer. Screening of recombinants, Reporter genes. Construction of cDNA and genomic library, Site directed mutagenesis. Applications of genetic engineering in agriculture, industry and medical, Biosafety regulations, Intellectual property rights, Patenting laws in India.

## Scheme of Examination

**Maximum Marks: 50 (40 External + 10 Internal)**          **Duration: 3 Hrs**
**Minimum Passing Marks:**     **13**
**External**

The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**

Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**
1. Principles of Gene Manipulation: An introduction to Genetic Engineering by R. W. Old, S. B. Primrose, University of California Press, 1980.
2. Molecular Genetics: An Introductory Narrative by Stent, G.S., Calendar, R. 2nd ed. San Francisco: W.H. Freeman, 1978.
3. Molecular Genetics of Bacteria by Larry Snyder and Wendy Champness, 3rd edition; ASM press; 2007.
4. Fundamental Bacterial Genetics by Nancy Trun and Janine Trempy, 1st edition; Blackwell Science Publishers; 2004.
5. Modern Microbial Genetics by U.N. Streips and R.E. Yasbin, 2nd edition; Wiley Publishers; 2002.

**RECOMMENDED READINGS:**
1. Microbial Genetics by Stanly R. Maloy, John E. Cronan, Jr. & David Freifelder, 2nd edition; Narosa Publishing House; 1987.
2. Molecular Biology by David P. Clarke, 1st edition; Elsevier Academic Press; 2005.
3. Molecular Cloning: A laboratory manual by Joseph Sambrook& David Russell, 3rd edition; CSHL press; 2001.
4. DNA Technology: The Awesome Skill by I. Edward Alcamo, 2nd edition; Hardcourt Academic Press; 2001.
5. Molecular Biology of the Gene by James Watson, Tania Baker, Stephen Bell, Alexander Gann, Michael Levine & Richard Losick , 6th Edition; CSHL Press; 2007.

**FS-MIC-CF-100: Introduction to Microbiology**
**Course Objectives:**

The students will be familiarized with the living world, biodiversity and classification. They will learn about various biomolecules found in microorganisms. They will learn the basics of Genetics and Genetic Engineering

**Course Level Learning Outcomes:**

Upon successful completion of the course, students will have the knowledge and skills to:

| CO1 | Get familiarized with different types of microorganisms |
|-----|---------------------------------------------------------|
| CO2 | Get familiarized with classification systems used for microorganisms |
| CO3 | Will be able to understand basics of Genetics and Genetic Engineering |

**Course Description**
**UNIT-1**

Development of microbiology as a discipline, Spontaneous generation vs. biogenesis, Endosymbiotic theory, Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Fleming Role of microorganisms in fermentation, Germ theory of disease, Contributions of Martinus W. Beijerinck, Sergei N. Winogradsky, Selman A. Waksman Establishment of fields of medical microbiology and immunology through the work of Paul Ehrlich, Elie Metchnikoff, Edward Jenner.

**UNIT- 2**

Binomial Nomenclature, Whittaker's five kingdom and Carl Woese's three domian classification systems and their utility. Difference between prokaryotic and eukaryotic cellular structures. General characteristics of different groups: Acellular microorganisms (Viruses, Viroids, Prions) and Cellular microorganisms (Bacteria, Algae, Fungi and Protozoa) with emphasis on their distribution and occurrence, pathogenicity and economic importance.

**UNIT-III**

Biomolecules: Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, nucleic acids; Enzymes- types, properties, enzyme action. Classical vs modern genetics, recombination in bacteria, cloning and applications of recombinant DNA technology. Molecular Basis of Inheritance: RNA and DNA as genetic material; Structure of DNA and RNA; DNA packaging; Basics of DNA replication, Central Dogma, transcription, genetic code, translation.

**Scheme of Examination**

**Maximum Marks: 50 (40 External + 10 Internal)**          **Duration: 3 Hrs**
**Minimum Passing Marks:          13**
**External**

The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**

Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**

1. Prescot, M.J., Harley, J.P. and Klein, D.A. Microbiology. 5th Edition WCB Mc Graw Hill, New York, (2002).
2. Tortora, G.J., Funke, B.R. and Case, C.L. Microbiology: An Introduction. Pearson Education, Singapore, (2004).
3. Alcomo, I.E. Fundamentals of Microbiology. VI Edition, Jones and Bartlett Publishers. Sudbury. Massachusetts, (2001).
4. Black J.G.Microbiology-Principlesand Explorations.JohnWiley&SonsInc.NewYork, (2002).
5. Pelczar, MJ Chan ECS and Krieg NR, Microbiology McGraw-Hill.
6. Willey,Sherwood,Woolverton. Prescott,Harley, and Klein's Microbiology McGraw-Hill publication

**RECOMMENDED READINGS:**

1. Tortora,Funke,Case. Microbiology.Pearson Benjamin Cummings.
2. JACQUELYN G. BLACK. Microbiology Principles and explorations. JOHN WILEY & SONS, INC.

3. Madigan,Martinko, Bender,Buckley,Stahl.Brock Biology of Microorganisms. Pearson
4. Tom Besty,D.C Jim Koegh.Microbiology Demystified McGRAW-HILL
**PRACTICALS**
Isolation and identification of bacteria by phenotypic and biochemical tests.
Enrichment and isolation of members of Rhodospirillaceae: analysis of photopigments.
Induction of *β*-galactosidase gene in *E. coli.*
Staining techniques.
Growth curve analysis.
Media preparation, sterilization, inoculation and incubation methods.
Microbiological studies of air, water and soil.
Evaluation of antimicrobial chemical agents by log reduction method
Effect of following on the growth of microbes-
(a) Temperature, (b) Aeration, (c) pH, (d) Salts, (e) Nutrients.
Quantitative tests for Carbohydrates, fats, proteins, chlorophyll, Nucleic acids
Isolation of carbohydrates, proteins and fats.
Chromatographic separation methods for pigments and amino acids.
Study of Enzyme kinetics
Preparation of biologically important buffers
Protein purification using various column chromatography, SDS-PAGE and NATIVE PAGE analysis.
Identification and screening of autotrophic mutants of *E. coli* by replica plating
PCR amplification of DNA
Electrophoresis of DNA/RNA/Protein.
Isolation of DNA/RNA from plant, animal cell, bacteria.
Transformation and Conjugation in Bacteria
Restriction digestion, ligation of DNA and cloning in bacteria
Randomly Amplified Polymorphic DNA (RAPD) analysis in bacteria
16SrDNA gene amplification analysis for sequencing

**Semester 2**
**Marking Scheme for External Exam**

| Theory Papers | Duration | Max. Marks |
|---|---|---|
| **FS-MIC-CC-201** | **3 Hrs.** | **40** |
| **FS-MIC-CC -202** | **3 Hrs.** | **40** |
| **FS-MIC-CC-203** | **3 Hrs.** | **40** |
| **FS-MIC-CC -204** | **3 Hrs.** | **40** |
| **Combined Practical** | **1 Day (6Hrs)** | **75** |

**FS-MIC-CC--201: Virology**
**Course Objectives:**
The objectives of this course are to provide basic understanding of the nature of human and plant viruses (including phages), viral classification, cultivation of viruses and viral diseases.
**Course Level Learning Outcomes:**
Upon successful completion of the course, students will have the knowledge and skills to:

| CO1 | Learn and explain the nature, structure, general properties and importance of different animal and plant DNA and RNA viruses. They will also learn various physical and chemical methods to assay viruses. |
|---|---|
| CO2 | The students will know about viral transmission, salient features of viral nucleic acids, replication and several diseases caused by viruses. |
| CO3 | Students will be acquainted with the bacteriophage structural organization, lytic and lysogenic cycles and its molecular mechanisms as well as bacteriophage typing. |

| CO4 | Through this course students will know the methods used in studying viruses, discern the replication strategies of representative viruses from the seven Baltimore classes. |
|------|------|
| CO5 | The students will comprehend the intricate interaction between viruses and host cells and will understand the interactions between viruses and the host immune system. |
| CO6 | Students will be acquainted with the terms oncogenes and tumor suppressor genes, and how tumor viruses interact with these products and their intersecting pathways and cause oncogenesis. |
| CO7 | Students will be able to define and explain vaccine strategies and mechanisms of antiviral drugs. |

## Course Description
### UNIT-I
Virology: Brief outline on discovery of viruses, Classification and nomenclature of viruses: distinctive properties and ultrastructure of viruses; DNA and RNA viruses, Replication of different groups of viruses; Cultivation of viruses in embryonated eggs, experimental animals and cell cultures.

### UNIT-II
Assay of viruses: physical and chemical methods (Protein, nucleic acid, radioactivity, electron microscopy), Infectivity assay (plaque method, end point method). Bacteriophage structural organization; Lytic and lysogenic cycles (molecular mechanisms), bacteriophage typing and its application in bacterial genetics; brief details on M13, T, Lamda and P1 phage.

### UNIT-III
Classifications and nomenclature of plant viruses; brief details of plant viruses like TMV, Cauliflower Mosaic Virus and Potato virus X; transmission of plant viruses.

Classification and nomenclature of animal and human viruses.Brief details of RNA viruses Picorna, OrthoMyxo, Paramyxo, Toga viruses, Rhabdo, Rota, HIV, Corona and Oncogenic Viruses; DNA viruses; Pox, Herpes, Adeno SV40; Hepatitis viruses, viral vaccines.

## Scheme of Examination
**Maximum Marks: 50 (40 External + 10 Internal)**          **Duration: 3 Hrs**
**Minimum Passing Marks:**      **13**

**External**
The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**
Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**
1.       Principles of Virology: Molecular Biology, Pathogenesis and Control of Animal Viruses by S.J. Flint, L.W. Enquist, V.R. Racaniello, and A.M. Skalka 2nd edition, ASM Press, Washington, DC, 2004.
2.       Introduction to Modern Virology EPZ by Nigel Dimmock, Andrew Easton and Keith Leppard, 5th edition, Blackwell Publishing, 2005.
3.       Human virology by Collier, L H (Leslie Harold), Kellam, Paul; Oxford, J S (John Sidney). 4th ed., Oxford : Oxford University Press, 2011.

**RECOMMENDED READINGS:**
1. Basic Virology by Edward K. Wanger, Martinez Hewiett, David Bloom and David Camerini, 3rd edition, Blackwell Publishing, 2007.
2. Principles of Molecular Virology by Alan J. Cann, 3rd edition, Elsevier Academic Press, 2001.
3. Plant Virology by Roger Hull, 4th edition, Academic press, 2002.

**Course Objectives:**
To introduce the learner to the basic concept of qualitative and quantitative analysis of various biological samples. Students would be taught about the biophysical and biochemical techniques currently available to investigate the structure and function of the biological macromolecules. Learner would be made aware about the various separation techniques and its instrumentation, principles behind each technique, make them familiar with various methods of analysing the output data and to build a strong foundation in the area of microbiology.

**Course Learning Outcomes:**
Upon successful completion of the course, the student will able to:

| | |
|---|---|
| CO1 | carry out the analysis of cellular structure using different type of microscopies. |
| CO2 | describe the techniques of vertical electrophoresis under native and SDS conditions. |
| CO3 | describe the techniques of horizontal electrophoresis. |
| CO4 | design a multi-step purification protocol to carry out spectroscopy. |
| CO5 | understand and correctly interpret various chromatographic techniques. |
| CO6 | understand the process of separation through centrifugation. |
| CO7 | perform different immunological and serological testing's |

**Course Description**
**UNIT-I**
Microscopy: Principles and use of light microscope, bright-field, dark-field, phase-contrast, fluorescent, electron microscopy (SEM, TEM), confocal microscopy and scanning probe microscopy. Specimen preparation for light microscopy and electron microscopy, staining of specific structures, fixatives and dyes, principle and uses of simple staining and differential staining. Principle and working of instruments used for sterilization.

**UNIT-II**
Electrophoresis: zonal techniques, supporting medium, vertical, submarine, gradient and two dimensional electrophoresis. Isoelectric focusing. Spectroscopy: Beer-Lambert relationship, components of a spectrophotometer, type of detectors; UV-Vis spectrophotometry, atomic absorption spectroscopy. Applications of spectroscopy.

**UNIT-III**
Chromatography: Adsorption Chromatography, liquid Chromatography, Gas- liquid Chromatography, Ion exchange Chromatography, Affinity Chromatography, GC-MS, HPLC.
pH meter, Centrifugation: Basic principle, working and application of analytical and preparative centrifuges, Differential, density gradient, zonal and isopycnic.

**Scheme of Examination**
**Maximum Marks: 50 (40 External + 10 Internal)**                    **Duration: 3 Hrs**
**Minimum Passing Marks:        13**

**External**
The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).
**Internal**
Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).
**REQUIRED READING:**
1. Principles and Techniques of Biochemistry and Molecular Biology. (6thEdition) by Wilson K. & Walker J. Cambridge University Press. 2008.
2. Biochemistry (6th edition) by Berg J. M., Tymoczko J. L. &Stryer, L. W.H. Freeman and Company, New York; 2007.
3. Foundations in Microbiology (6th edition) by Talaro K. P. &Talaro A. McGraw-Hill College, Dimensi;2006.
4. Analysis of Biological Molecules: An Introduction to Principles, Instrumentation and Techniques, by Potter G. W. H. & Potter G. W. Kluwer Academic Publishers; 1995.
5. Prescott/Harley/Klein's Microbiology by Willey J., Sherwood L. and Woolverton C. McGraw Hill; 2007.

**RECOMMENDED READING:**
1. "Dynamics of Water and Ions near DNA: Perspective from Time☐Resolved Fluorescence Stokes Shift Experiments and Molecular Dynamics Simulation" Him Shweta, Nibedita Pal, Moirangthem Kiran Singh, Sachin Dev Verma and Sobhan Sen* Book Chapter in Reviews in Fluorescence 2017, Springer (DOI: https://doi.org/10.1007/978☐3☐030☐01569☐5).

2. "New Family of Fluorescent Probes for Characterizing Depth☐Dependent Static and Dynamic Properties of Lipid/Water Interfaces" Moirangthem Kiran Singh, Him Shweta and Sobhan Sen* Book Chapter in Analysis of Membrane Lipids 2020, Springer (DOI: https://doi.org/10.1007/978☐1☐0716☐0631☐5_10

## FS-MIC-CC-203: Eukaryotic Microbiology
### Course Objectives:

This course deals with detailed general characteristics, life cycle and important agricultural and biotechnological applications of important Fungi, Yeats, Algae and Protozoa.

### Course Level Learning Outcomes:

Upon successful completion of the course, the learner will be able to :

| | |
|---|---|
| CO1 | The students will gain knowledge about general characteristics and life cycle of important fungi such as *Dictyostelium, Rhizopus, Saccharomyces, Candida, Trichoderma, Penicillium, Gliocladium* etc. |
| CO2 | The students will gain knowledge about Fungal endophytes of tropical plants and their applications. |
| CO3 | The students will gain knowledge about Agriculturally important toxigenic fungi, their biodiversity, and application of toxigenic fungi in sustainable agriculture. |
| CO4 | The students will gain knowledge about Mycorrhizal fungi: their diversity and importance in agriculture and plant growth in general, and recent advances in the field of mycorrhiza. |
| CO5 | The students will know various biotechnological applications of yeasts. |
| CO6 | The students will understand General Characteristics and Life Cycle of important Algae such as *Volvox, Chlamydomonas, Sargassum, Fucus, Gracileria* and *Gelidium.* |
| CO7 | The students will know various biotechnological applications of algae. |
| CO8 | The students will know the general characteristics and life cycle of various important Protozoa such as *Entamoeba, Trypanosoma, Plasmodium,* and *Coccidia.* |

### Course Description
### UNIT-I

**General Characteristics and Life Cycle of important Fungi**- *Dictyostelium, Rhizopus, Saccharomyces, Candida, Trichoderma, Penicillium, Gliocladium, Fusarium, Helminthosporium, Alternaria, Albugo.* Fungal endophytes of tropical plants and their applications: Endophytic fungi, colonization and adaptation of endophytes. Agriculturally important toxigenic fungi: Biodiversity, toxigenic fungi in sustainable agriculture with special emphasis on biopesticides.

### UNIT-II

Mycorrhizal fungi: Diversity of endo- and ectomycorrhizal fungi. Biology of arbuscular mycorrhizal fungi: signaling, penetration and colonization inside roots, culturing and benefits, recent advances in the field of mycorrhiza. Biotechnological applications of yeasts: Yeasts as producers of bioactive molecules such as pigments, lipids, organic acids and EPS, yeasts as probiotics, yeasts in bioremediation, yeasts in alcoholic fermentations.

### UNIT-III

**General Characteristics and Life Cycle of important Algae**- *Volvox* and *Chlamydomonas, Sargassum* and *Fucus, Gracileria* and *Gelidium.* Algal diversity from morphology to molecules: Importance of algae in production of algal pigments, biofuels, hydrogen production, important bioactive molecules, role of algae in sustainable environment. Important Protozoa- *Entamoeba, Trypanosoma, Plasmodium, Coccidia.*

### Scheme of Examination

**Maximum Marks: 50 (40 External + 10 Internal)**          **Duration: 3 Hrs**

**Minimum Passing Marks:** **13**

**External**

The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**

Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**

1. Fundamentals of the fungi by Elizabeth Moore, Fourth edition, Benjamin Cummings; Landecker;1996.
2. Mycotechnology: Present status and future prospects. Edited by MahendraRai.I.K., International Publishing House Pvt. Ltd.; 2007.
3. The Yeast Handbook: Biodiversity and Ecophysiology of yeasts by Carlos A. Rosa and Gabor Peter. Springer-Verlag Berlin Heidelberg; 2006.
4. Algae: Anatomy, Biochemistry and Biotechnology by Laura Barsanti and Paolo Gualtieri. Taylor and Francis Group, LLC; 2006.
5. Prescott. Microbiology 14. Joklik W.K., Zinssers. Microbiology. Mc Graw Hill.

**RECOMMENDED READINGS:**

1. Burnett J.H. Fundamentals of Mycology. Edwar Arnold, Crane Russak.
2. Charlie M. and Watkinson S.C. The Fungi. Academic Press.
3. Moore E. Landeekeer. The Fundamentals of Fungi. Prentice Hall.
4. Venkataraman G.S., Goyal S.K., Kaushik, B.D. and Rouchoudhary, P. Algae-Form and Function.
5. Alexopolous C.J. and Mims C.W. 1979. Introduction to Mycology (3/e). Wiley Eastern, New Delhi.
6. Kotpal R.L. Protozoa.
7. Mehrotra RS and Aneja KR 1990. An introduction to Mycology. New Age Int Pub.
8. E. Moore & Lendecker Fundamentals of the fungi
9. I.K. Ross Biology of the fungi
10. Alan T. Bull. Microbial Diversity and Bioprospecting. ASM press. Washington, D.C.
11. Stanier RY, Ingraham J.L., Wheelis M.L., Painter P.R. 1999. General Microbiology. MacMillan Education Ltd., London.
12. Schlegel. General Microbiology. Cambridge University Press, Cambridge.

## FS-MIC-CC-204: Industrial and Food Microbiology

### Course Objective:

This course elaborates on various processes and instruments used in Industrial and food Microbiology. It deals with different type of industrially important microorganisms their growth and preservation methods and their application in different processes related to industrial and food microbiology.

### Course Level Learning Outcomes:

Upon successful completion of the course, the learner will be able to :

| CO1 | Comprehend the theoretical and practical understanding of industrial microbiology |
| --- | --- |
| CO2 | Know how to screen and isolate microorganisms of industrial importance from the environment |
| CO3 | Know about design of bioreactors and factors affecting their growth and production. |
| CO4 | Understand the rationale in medium formulation & design for microbial fermentation, sterilization of instrument medium and air. |
| CO5 | Appreciate the different types of fermentation processes |
| CO6 | Identify techniques applicable for Improvement of microorganisms based on known biochemical pathways and regulatory mechanisms |

| CO7 | Comprehend the techniques and the underlying principles used in downstream processing. |
|-----|----------------------------------------------------------------------------------------|
| CO8 | Understand the role of microorganisms in food spoilage and preservation.               |

## Course Description
### UNIT-I
Introduction to fermentation processes, history of fermentation process.

Bioreactors: Design and components- vessel materials, baffles, impellers, inoculation and sampling devices, biosensors etc., biohazard and containment. Types of bioreactors: airlift, fluidized bed, micro carrier, photo bioreactor, stirred bioreactor. Immobilization of cells and its industrial application (Pharmaceutical, food and chemical industries).

### UNIT-II
Isolation, selection, screening, preservation and maintenance of industrially important microorganisms.

Formulation of fermentation media: energy source, water, nitrogen source, minerals, chelators, growth factors, buffers, precursors, inhibitors and antifoam agents, Optimization of media. Media and air sterilization. Types of fermentation processes with Growth kinetics: Batch, continuous and fed batch. Downstream processing: foam separation, cell disruption, industrial scale centrifugation, liquid-liquid extraction, solvent recovery, chromatography, two phase aqueous extraction, drying and crystallization.

### UNIT-III
Production process for Yeast (Bakers, food and fodder), Single cell protein (SCP), Single cell and Single cell oil (SCO), lactic acid, Beer, Wine, Whisky, Sauerkraut, Bread, amylases and proteases, penicillin, streptomycin, Riboflavin, Production of non-microbial product through GEMs: insulin, cell growth factors, tissue plasminogen activator. Bioplastic (PHB, PHA), Steroid transformation. Production of bioinsecticides. Vaccine types: live, attenuated and recombinant and their production.

Parameters Affecting Microbial Growth in Foods: Intrinsic, Extrinsic. Food Preservation & Principles of Quality Control: Chemicals, antibiotics, Radiation, Low and high temperature, High-Pressure Processing. Aseptic Packaging, Microbiological quality standards of food, FDA, HACCP, ISI.

Microbial Food Spoilage and Food borne diseases: Staphylococcal, *E. coli*, Salmonellosis, shigellosis. Mycotoxins, Aflatoxins, and viruses.

## Scheme of Examination
**Maximum Marks: 50 (40 External + 10 Internal)**            **Duration: 3 Hrs**
**Minimum Passing Marks:**       **13**

**External**
The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**
Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**
1. Biotechnology: A Text Book of Industrial Microbiology by W. Crueger & A. Crueger, Panima Publishing Corporation, New Delhi/Bangalore, 2000.
2. Principles of Fermentation Technology by P.F. Stanbury, W. Whitaker &S.J. Hall, Aditya Books (P) Ltd., New Delhi, 1997.
3. Modern Industrial Microbiology & Biotechnology by N. Okafer, Scientific Publishers, Enfield, USA.,2007.
4. Fermentation Microbiology and Biotechnology by El Mansi & Bryce, Taylor & Francis, London, Philadelphia, 1999.
5. Fermentation Biotechnology by O.P. Ward, Open University Press, Milton Keynes, U.K., 1989
6. Industrial Microbiology: An Introduction by Waites, Morgan, Rockey& Highton, Blackwell Science, 2001.
7. Biochemical Engineering and Biotechnology by B. Atkinson & F. Mavituna , The Nature Press, 1982
8. Microbial Biotechnology: Fundamentals of Applied Microbiology by Glazer & Nikaido , W.H. Freeman and Co., New York, 1995.
9. Modern Food Microbiology, 4th edition by J.M. Jay, Springer, 2006.
10. Fundamental Food Microbiology, 3rd edition by B. Ray., CRC press, 2006.
11. Food Microbiology: Fundamentals and Frontiers, 2nd edition by Michael P. Doyle, Larry R. Beuchat, Thomas J. Montville, ASM press, 2001.

12. Food Microbiology by M.R. Adams & M.O. Moss., Royal Society of Chemistry, 2000.

13. Food Microbiology by M.R. Adams, Royal Society of Chemistry, 2008.

**RECOMMENDED READINGS:**

1. Modern Industrial Microbiology & Biotechnology by N. Okafer, Scientific Publishers, Enfield, USA., 2007.
2. Fermentation Microbiology and Biotechnology by El Mansi & Bryce, Taylor & Francis, London, Philadelphia, 1999.
3. Fermentation Biotechnology by O.P. Ward, Open University Press, Milton Keynes, U.K., 1989
4. Industrial Microbiology: An Introduction by Waites, Morgan, Rockey & Highton, Blackwell Science, 2001.
5. Biology of Industrial Microorganisms A.L. Duncun
6. Microbial Biotechnology A. N. Glazer and H. Nikaido
7. Molecular Industrial Mycology Leong & Berka
8. Manual of Industrial Microbiology and Biotechnology, Demain & Davies, 2nd ed.
9. Microbial Biotechnology A. N. Glazer and H. Nikaido
10. Biotechnology An Introduction Susan R. Barnum 22. Topics in Enzyme & Fermentation Biotechnology Volumes by Wisemen

**PRACTICALS**

Mounting and staining of fungal specimens, microscopic examination of bacteria, fungi, protozoa and nematodes

Chick embryo inoculation for viruses.

Estimation of infectivity titre of a virus sample using Plaque assay.

Production of purified virus stock and its quantification.

Study of virus infected plant material.

Isolation of Probiotic bacteria from milk and curd

Study of dimorphism in yeast

Testing of milk by MBRT.

Isolation and cultivation of fungi and protozoa.

Microbial examination of food and milk

Sample collection and biomass determination for small scale fermentation

To determine the specific growth rate and generation time of a bacterium during submerged fermentations.

To determine R: S ratio of bacteria by CFU counts.

To determine phenol coefficient

To determine Thermal death time and thermal death point.

To check the calibration of spectrophotometer

To check and verify Lambert- Beer Law

To find out the $\lambda$-max (absorption spectra) of $K_2Cr_2O_7$, $CuSO_4$, proteins and nucleic acids.

To grow yeast and fungus in artificial medium and to calculate the yield and productivity of biomass produced.

To make wine from different juices by fermentation.

To demonstrate production of sauerkraut and cheese.

To investigate heavy metals/pesticides etc. in the given food and water sample.

### FS-MIC-CF-200: National and Human Values

#### Objectives:

1. To inculcate national and human values in the Students.
2. To enable the students imbibe the Indian cultural ethos.
3. To inculcate the spirit of Patriotism so that the Students develop a sense of strong bond with the nation.
4. To enable the Students grow into a citizen possessing civic sense.

#### Course Outcomes:

(i) On the completion of the course the students shall be able to

(ii) Attain the civic skills enabling him/her to become a well-behaved citizen of the country.

(iii) Imbibe and spread the feelings of devotion and dedication.

#### Course Description:

#### Unit-I

1. NCC – Introduction, Aims, NCC Flag, NCC Song, NCC Administration, Raising of NCC in Schools/Colleges, NCC: Rank, Honours and Awards, NCC Training, NCC Camps, NCC Examinations, Incentive and Scholarship for Cadets.
2. Importance of Discipline in life, Aims and Merits of Discipline, Problems related to Indiscipline and Solutions.
3. Drill – Definition, Principles of Drill, Bad habits in drill, Words of Command, Drill Movements, Arms Drill, Squad Drill, Guard of Honour, Ceremonial Drill, Guard Mounting.
4. Contribution of NCC in Nation Building.

**Unit-II**

1. Armed Forces – Control Command, Organization of Armed Forces, Weapons of Army, Navy and Air Force, Training institutes, Honours and Awards, Recipients of Param Veer Chakra, Badges of Ranks.
2. Commission in Armed Forces – Recruitment in Armed Forces, Commission in Technical, Non-Technical and Territorial Forces.
3. Weapon Training – 0.22 Rifle, 7.62 Rifle, 7.62 SLR (Self Loading Rifle), 5.56 MM I.N.S.A.S. Rifle, L.M.G. (Light Machine Gun), Stan Machine Carbine, 2" Mortar, Grenade, Pistol, Various types of Firing, Range Procedure and Range Drill.
4. Military History and Geography, Field Craft, Field Engineering, Battle Craft.

**Unit-III**

1. Obstacle Training. Adventure Training, Self Defence, Physical Posture Training.
2. Social Service, Disaster Management, Health and Hygiene, First Aid.
3. Leadership, Personality Development, Decision Making, Motivation, Duty and Discipline, Morale.

**Unit-IV**

1. Value system – The role of culture and civilization-Holistic living
2. Balancing the outer and inner – Body, Mind and Intellectual level- Duties and responsibilities
3. Salient values for life- Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity , and inclusiveness
4. Self-esteem and self confidence
5. punctuality – Time, task and resource management ,Team work
6. Positive and creative thinking.

**Unit-V**

1. Universal Declaration of Human Rights
2. Human Rights violations
3. National Integration – Peace and non-violence (in context of Gandhi, Vivekanad)
4. Social Values and Welfare of the citizen
5. The role of media in value building
6. Fundamental Duties
7. Environment and Ecological balance – interdependence of all beings – living and non-living.

**Assessment and Evaluation:**

The Students shall be assessed and evaluated as per the schedule given below –

1. Project Report / Case Study (in 5000-7000 words) – 75%
2. Viva-voce  - 25%

The topics for the Project Report / Case Study shall be allotted by the Nodal Department (decided jointly with NSS wing under the supervision or IQAC) in consultation with the Department concerned. The Candidate shall submit the Report by the date fixed for the said purpose. It shall then be followed by a Viva-voce Examination. The whole evaluation shall be done by the Departmental Internal Faculty in consultation with the Nodal Department. It is a non-creditable Paper. The Student will have  to score simply a qualifying score/grade as specified in the CBCS rules.

The candidate will have to qualify the paper by the time He / She qualifies for the Programme. He/She can avail maximum 3 chances along with the Semester Examinations.

**Books Recommended:**

1. Hand Book of NCC : Major R C Mishra & Sanjay Kumar Mishra
2. National Security: K. Subramanyam
3. ASEAN Security: Air Comdr. Jasjit Singh
4. Indian Political System, Dr . Pukhraj Jain & Dr. Kuldeep Fadiya
5. हैण्ड बुक ऑफ एनसीसी , मेजर आर. सी. मिश्र एवं संजय कुमार मिश्र
6. अन्तर्राष्ट्रीय राजनीतिः वी. एल. फाड़िया
7. भारतीय राजव्यवस्था , डॉ. पुखराज जैन , डॉ. कुलदीप फड़िया
8. राष्ट्रीय प्रतिरक्षाः डॉ. हरवीर शर्मा , जयप्रकाश नाथ कंपनी , मेरठ
9. राष्ट्रीय सुरक्षाः डॉ. लल्लन सिंह , प्रकाश बुक डिपो , बरेली
10. राष्ट्रीय सुरक्षाः डॉ. नरेन्द्र सिंह , प्रकाश बुक डिपो , बरेली
11. राष्ट्रीय सुरक्षाः डॉ. पाण्डेय व पाण्डेय , प्रकाश बुक डिपो , बरेली

**12.** राष्ट्रीय रक्षा व सुरक्षाः डॉ. एस. के. मिश्र , मार्डन पब्लिशर्स , जालंधर

13. NCERT, Education in Values, New Delhi, 1992.
14. M.G.Chitakra: Education and Human Values, A.P.H. Publishing Corporation, New Delhi,2003.
15. Chakravarthy, S.K.: Values and ethics for Organizations: Theory and Practice, Oxford University Press, New Delhi, 1999.
16. Satchidananda, M.K.: Ethics, Education, Indian Unity and Culture, Ajantha Publications,Delhi, 1991.
17. Das, M.S. & Gupta, V.K.: Social Values among Young adults: A changing Scenario, M.D.Publications, New Delhi, 1995.
18. Bandiste, D.D.: Humanist Values: A Source Book, B.R. Publishing Corporation, Delhi,1999.
19. Ruhela, S.P. : Human Values and education, Sterling Publications, New Delhi, 1986.
20. Kaul, G.N.: Values and Education in Independent Indian, Associated Publishers, Mumbai,1975.
21. Swami Budhananda (1983) How to Build Character A Primer : Ramakrishna Mission, NewDelhi.
22. A Cultural Heritage of India (4 Vols.), Bharatiya Vidya Bhavan, Bombay. (SelectedChapters only) For Life, For the future : Reserves and Remains –UNESCO Publication.
23. Values, A Vedanta Kesari Presentation, Sri Ramakrishna Math, Chennai, 1996.
24. Swami Vivekananda, Youth and Modern India, Ramakrishna Mission, Chennai.
25. Swami Vivekananda, Call to the Youth for Nation Building, Advaita Ashrama, Calcutta.
26. Awakening Indians to India, Chinmayananda Mission, 2003.

## MASTER OF SCIENCE IN MICROBIOLOGY
### Semester 3
### Marking Scheme for External Exam

| Theory Papers | Duration | Max. Marks | |
|---|---|---|---|
| FS-MIC-CC-301 | 3 Hrs. | | 40 |
| FS-MIC-CC-302 | 3 Hrs. | | 40 |
| FS-MIC-CE-303(A) | | | |
| OR | 3 Hrs. | | 40 |
| FS-MIC-CE-303(B) | | | |
| FS-MIC-OE-304(A) | | | |
| OR | 3Hrs. | | 40 |
| FS-MIC-OE-304(B) | | | |
| Combined Practical | 1 Day (6Hrs) | 75 | |
| Academic/Industrial Tour | 1-5 Days | 00 | |

### FS-MIC-CC-301: Immunology
### Course Objectives:

The objective of this course is to provide a detailed overview of immune system to the learners. The learner will understand structure, organization and functions of various components of the immune system like antigen, antibody, organs, MHC, cytokines and others in the defence system of the body. It would also make them understand the concepts of innate and adaptive immunity, immune diversity and specificity, autoimmunity, hypersensitivity, transplantation and others.

### Course Level Learning Outcomes:

Upon successful completion of the course, the learner will be able to :

| CO1 | describe the fundamental bases of immune system and immune response |
|---|---|
| CO2 | explain about the importance of innate immunity and acquired immunity |
| CO3 | describe the structure and organization of various components of the immune system |
| CO4 | describe the genetic basis for the expression of immune cell receptors and generation of immunological diversity, complement system |
| CO5 | understand the operation and the mechanisms which underlie the immune response |
| CO6 | explain knowledge of various diseased conditions generated due to interplay of immune system components. |
| CO7 | perform different immunological and serological testing's |

### Course Description
### UNIT-I

Historical background: Humoral and Cellular components of the immune system. Innate Immunity: Skin & mucosal surface, Physiological Barriers, Phagocytic barriers, Inflammation, Adaptic immunity. Cells and Organs of Immune System. Antigens: Structure, properties, types, epitopes, haptens. Immunogens, Adjuvants.

Antibodies: Structure, function and diversity, antibody mediated functions, classes and biological activities. Monoclonal antibodies. Antigen-Antibody Interaction. Major Histocompatibility Complex- structure, functionsand genes. Cytokinesis (Properties, receptors, antagonism & secretion). The complement system (functions, components, activation, regulation and deficiencies). Cell mediated effecter responses: Cytotoxic T-cells, natural killer cells, antibody-dependent cell-mediated cytotoxicity.

## UNIT-III

Hypersensitive reactions (Type I,II,III and delayed type (DTH). Immune response to infectious diseases: viral, bacterial and protozon. Vaccines.Immuno-deficiencies.

**Transplantation;** Graft rejection, mechanism and prevention, HLA and disease**.**

**Autoimmunity;** Organ specific and systemic,Autoantibodies, experimental models

## Scheme of Examination

**Maximum Marks: 50 (40 External + 10 Internal)**                                          **Duration: 3 Hrs**

**Minimum Passing Marks:         13**

**External**

The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**

Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**

1. Kuby Immunology by Kindt TJ, Goldsby RA, Osborne BA, Kuby J: 6th edition. New York. WHFreeman; 2006.
2. Cellular and Molecular Immunology by Abbas AK, Lichtman AH, Pillai S: Saunders Elsevier;
2007.
3. Immunobiology: The immune system in health and disease by JanewayCA,TraversP,Walport M,Shlomchik MJ: 6th edition. New York. Garland Science Publishing; 2005.
4. Medical Microbiology and Immunology by Levinson W, Jawetz E: Lange publication; 2001.
5. Fundamental Immunology by Paul WE: 4th edition. New York. Raven Press; 2000.
6. Roitt's Essential Immunology by Delves PJ, Martin SJ, Burton DR, Roitt IM; 11th
edition. Blackwell Publishing/Oxford Univ. Press; 2006.

**RECOMMENDED READINGS:**

1. Clark W.R. 1991. The experimental foundations of modern immunology. John Wiley
2. Mackie & McCartney. Medical Microbiology. 14/e.
3. Bailey & Scott's Diagnostic Microbiology.
4. Franklin TJ, Snow GA. 1981.Biochemistry of antimicrobial action. Chapman & Hall, New York.
5. Roitt IM. 1995. Essential Immunology. Blackwell Sci. Oxford.
6. Roth J.A. 1985. Virulence mechanisms of bacterial pathogens. American Society for Microbiology. Washington D.C.
7. Smith CGC. 1976. Epidemiology and infections. Medowfief Press Ltd. Shildon, England.
8. Stiem F. 1980. Immunological disorders in infants and children. W.B. Saunders & Co. Philadelphia. Page 19 of 27
9. Todd IR. 1990. Lecture notes in immunology. Blackwell Sci. Pub. Oxford.
10. Roitt IM, Brostoff and Male 1995. Immunology 4/e Gower Medical Pub Co..
11. Kuby J 1994. Immunology. 2/e. W.H. Freeman and Co., New York.

## FS-MIC-CC-302: Soil and Agricultural Microbiology

## Course Objective

This course elaborates on soil, its types, formation and its characteristics. It describes and discusses the role of microorganisms in nutrient re-cycling, microorganisms associated with different parts of the plants and their role in plant health and diseases.

## Course Level Learning Outcomes:

Upon successful completion of the course, the learner will be able to :

| CO1 | Appreciate the diversity of microorganism and microbial communities inhabiting soil. |
|-----|---------------------------------------------------------------------------------------|
|     |                                                                                       |

| CO2 | Learn the occurrence, abundance and distribution of microorganism on various surfaces of plants also learn different methods for their detection and characterization. |
|-----|---|
| CO3 | Competently explain various aspects of agriculture microbiology and to become familiar with current research in soil and agricultural microbiology. |
| CO4 | Understand various biogeochemical cycles – Carbon, Nitrogen, Phosphorus cycles etc. and microbes involved. |
| CO5 | Understand various plant microbes interactions especially rhizosphere, phyllosphere and mycorrhizae and their applications especially the biofertilizers and their production techniques |
| CO6 | Understand the role of microorganisms in promoting plant growth and their protection from pathogens. |
| CO7 | Understand the role of microorganisms in causing different plant diseases and their cure. |
| CO8 | Learning the application of microorganism as biopesticides and their mass production techniques. |

## Course Description
### UNIT-I

Soils: Origin and evolution, soil profiles. Major physiochemical and biological characteristics. Soil microflora: distribution and contribution to ecosystem.

Biogeochemical cycles: Carbon cycle, Nitrogen Cycle, Phosphorus cycle, Sulphur cycle, Iron and Manganese cycle. Bioleaching and biomining. Agricultural and urban waste compost, vermicompost, mushroom compost, silage, methane production, biogas plants. Microbiology of Rhizospheres, phyllosphere and spermosphere,

### .UNIT-II

Plant Diseases: Physiology of parasitism, mechanism of disease resistance, host parasite relationship. Symptomatology and control measure of various diseases.
Viral diseases: TMV, Yellow vein mosaic of Bhindi, and Papaya leaf curl.
Bacterial diseases: Citrus canker, Crown gall
Fungal diseases: Green ear of bajra, Wheat rusts and Loose and Covered smuts.
Mycoplasmal diseases: Witches broom of potato, Stripe disease of sugarcane

### UNIT-III

Biofertilizers: Production technology, standards, storage and application methods for *Rhizobium, Azotobacter, Azospirillium*, Cyanobacteria, *Azolla.* Biological nitrogen fixation - nitrogenase enzyme - nif genes; symbiotic nitrogen fixation - (*Rhizobium, Frankia*)- non-symbiotic microbes- *Azotobacter- Azospirillium* PSM, Cellulolytes, VAM and PGPR. Microbial pesticides: biology and chemistry of the biocidal component, mode of action, effect on target organisms, production technology. Microbial insecticides; advantages of microbial insecticides, limitations-Mass production techniques; fermentation, formulation of insecticides, carrier materials quality control etc.

## Scheme of Examination

**Maximum Marks: 50 (40 External + 10 Internal)**            **Duration: 3 Hrs**
**Minimum Passing Marks:**      **13**
**External**
The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).
**Internal**
Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**
1. Plant Pathology by Agrios G. N. Academic Press, San Diego;1997.
2. The Nature and practice of Biological Control of Plant Pathogens by Cook R. J. & Baker K. F.; 1983.
3. Amereca Phytopathological Society Press, St. Paul, MN.
4. Environmental Biotechnology by Forster C. F. & John D.A. Ellis Horwood Ltd. Publication;2000.
5. A Manual of Environmental Microbiology by Christon J. H. ASM Publications;2001.
6. Soil Microbiology by Rao, N.S.S. Oxford & IBH Publishing Co., New Delhi;1999.

**RECOMMENDED READINGS:**
1. Erneasst WC 1982. The environment of the deep sea. Vol.II J.G. Morin Rubey.
2. Norris JR and Pettipher GL 1987. Essays in agricultural and food microbiology. John Wiley & Sons, Singapore.
3. Burges A and Raw F 1967. Soil Biology. Academic Press, London.
4. Vanghan D and Malcolm RE. 1985. Soil Organic Matter and Biological Activity. Martinus Nighoff W. Junk Pub.
5. Buckman H. and Brady N.C. The nature and properties of soil. Eurasis Pub. House (P.) Ltd. New Delhi.

## FS-MIC-CE-303(A): Medical Microbiology

### Course objectives:

The course objectives are to impart knowledge on infectious disease epidemiology and outbreaks. It deals with the knowledge of pathogenic microorganisms (viruses, bacteria, fungi), their characterization, pathogenesis, control and treatment.

### Course Level Learning Outcomes:

Upon successful completion of the course, students will have the knowledge and skills to:

| | |
|---|---|
| **CO1** | Understand and explain the various stages of infectious diseases, describe various modes by which infections spread in community, describe various methods that can be adopted to control spread of infection in community, understand and explain various hospital borne, air borne and water-borne diseases |
| **CO2** | By the end of this course, the students will be able to safeguard themselves and society and can work in diagnostics laboratories and hospitals. They will be able to classify and characterize diseases causing organisms like bacterial, fungal, viral etc. |
| **CO3** | Through this course students will learn the role of pathogenic bacteria in human disease with respect to infections of the respiratory tract, gastrointestinal tract, urinary tract, skin and soft tissue. |
| **CO4** | They will acquire a clear understanding about host pathogen interaction, normal microflora in the human body and different sample collection and analysis. |
| **CO5** | Students will be able to understand the pathogenesis, epidemiology of diseases and their causative agents. They also learn about the diagnosis of various microbial diseases. |
| **CO6** | Through this course the students will also learn about the antimicrobial agents, their characteristics, mode of action etc. |
| **CO7** | The student at the end of the course will be able to gain knowledge about vaccination, screening of various diseases. |

## UNIT-I

Early discovery of pathogenic microorganisms. Pathogenicity and virulence; Quantitative measures of virulence: minimal lethal dose (MLD), LD 50 , ID 50, TCID 50. Normal microbial flora of the human body; role of the resident flora. Nosocomial infection, common types of hospital infections and their diagnosis and control, Molecular diagnosis of diseases: basic principles and techniques involving nucleic acid in relation to laboratory evaluation of disease.

## UNIT-II

**Important diseases of human beings** (short description of causal agent, pathogenesis, diagnosis and treatment)
**Bacterial diseases**: Typhoid, Syphilis, Cholera, Gonorrhoeae, Tuberculosis, Diphtheria, Tetanus, Plague, Botulism, Meningitis, Pneumonia, Enteritis.
**Viral diseases**: Influenza, Herpes, AIDS, Rabies, SARS, Human Pox, Yellow fever, Mumps and Measles.
**Fungal diseases**: Ringworm, Toxoplasmosis.
**Important bacterial** (Anthrax, Black quarter, Tuberculosis, Brucellosis) **and viral** (Foot and mouth disease, Rinderpest, Cowpox, Rabies) **diseases of domestic animals**, their causal agents, epidemiology, pathogenesis, diagnosis, vaccine and treatment).

## UNIT-III

Antimicrobial therapy; Antibiotics and their classification, mode of action, Antimicrobial resistance: Multidrug efflux pumps, X- MDR *M. tuberculosis*, Methicillin-resistant *S. aureus* (MRSA), various methods of drug susceptibility testing. Brief account on available vaccines and schedules. Coordinated regulation of virulence genes, two component signal transduction systems, secretion systems, biofilms and quorum sensing.

## Scheme of Examination

**Maximum Marks: 50 (40 External + 10 Internal)**                    **Duration: 3 Hrs**
**Minimum Passing Marks:            13**
**External**
The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).
**Internal**
Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**
1. Jawetz, Melnick, & Adelberg's Medical Microbiology by Brooks GF, Butel JS, Morse SA, Melnick JL, Jawetz E, Adelberg EA . 23rd edition. Lange Publication. 2004.
2. Cellular Microbiology by Cossart P, Boquet P, Normark S, Rappuoli R eds. 2nd edition. American Society for Microbiology Press. 2005.
3. Bacterial Pathogenesis: A molecular approach by Salyers AA and Whitt DD eds. American Society for Microbiology Press, Washington, DC USA. 2002.
4. Pathogenomics: Genome analysis of pathogenic microbes by Hacker J and Dorbindt U. ed. Wiley-VCH. 2006.
5. Molecular Microbiology: Diagnostic Principles and Practice by Persing DH, Tenover FC, Versalovic J, Tang Y, Unger ER, Relman DA, White TJ eds. American Society for Microbiology Press, 2004.
6. Infectious Disease Epidemiology: Theory and Practice by Nelson KE, Williams CM,
Graham NMH eds. An Aspen Publication. 2001.

**RECOMMENDED READINGS:**
1. Morag C. and Timbury M.C. 1994. Medical virology. X/e. Churchill Livingstone, London.
2. Topley and Wilson 1995. Text book on Principles of Bacteriology, Virology and Immunology. Edward Arnold, London
3. Mackie and McCartney. 1996. Medical Microbiology. Vol.1. Microbial Infection, Vol. 2. Practical Medical Microbiology. Churchill Livingstone.
4. Shanson DC. Wright PSG1982. Microbiology in Clinical Practice.

## FS-MIC-CC-303(B): Food and Dairy Microbiology
### Course Objectives:

The students will be familiarized with the apparatus and equipment used in a microbiology laboratory, how to maintain aseptic conditions in microbiological experiments. They will learn to prepare culture media, isolate and culture bacteria and fungi and to extract nematodes. They will learn to study the general morphological features of different microorganisms.

## Course Level Learning Outcomes:

Upon successful completion of the course, students will have the knowledge and skills to:

| | |
|------|------------------------------------------------------------------------------------------------------------------|
| **CO1** | Are able to describe the role of microorganisms in the production of food, its spoilage, including their role in homemade fermented foods. |
| **CO2** | Are able to understand different intrinsic and extrinsic factors responsible for food spoilage. |
| **CO3** | Are able to identify the role of microorganisms in the causation of the diseases and how to protect against food-borne pathogens. |
| **CO4** | Developed experimental skills for testing the milk and different foods for the presence of microorganisms |

## Course Description

### UNIT-I

Dairy starter cultures, fermented dairy products: yogurt, acidophilus milk, kumiss, kefir, dahi and cheese, other fermented foods: dosa, sauerkraut, soy sauce and tampeh, Probiotics: Health benefits, types of microorganisms used, probiotic foods available in market. Utilization and disposal of dairy by-product – whey.

### UNIT-II

Intrinsic and extrinsic factors that affect growth and survival of microbes in foods, natural flora and source of contamination of foods in general. Principles, Spoilage of vegetables, fruits, meat, eggs, milk and butter, bread, canned Foods. Principles of food preservation: temperature, canning, drying, irradiation, microwave processing and aseptic packaging, chemical methods of food preservation: salt, sugar, organic acids, $SO_2$, citrates, benzoates, nitrite and nitrates etc.

### UNIT-III

Food borne diseases (causative agents, foods involved, symptoms and preventive measures)- Food intoxications: Staphylococcus aureus, Clostridium botulinum and mycotoxins; Food infections: Bacillus cereus, Vibrio parahaemolyticus, Escherichia coli, Salmonellosis, Shigellosis, Yersinia enterocolitica, Listeria monocytogenes and Campylobacter jejuni. Cultural and rapid detection methods of food borne pathogens in foods. Food sanitation and control; HACCP, Indices of food sanitary quality and sanitizers.

## Scheme of Examination

**Maximum Marks: 50 (40 External + 10 Internal)**            **Duration: 3 Hrs**
**Minimum Passing Marks:**       **13**
**External**

The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**

Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**
1. Banwart, GJ. Basic Food Microbiology. CBS Publishers and Distributors, Delhi. (1989).
2. Hobbs BC and Roberts D. Food poisoning and Food Hygiene. Edward Arnold (A division of Hodder and Stoughton) London.
3. Joshi. Biotechnology: Food Fermentation Microbiology, Biochemistry and Technology. Volume 2.
4. John Garbult. Essentials of Food Microbiology. Arnold International.
5. John C. Ayres. J. Orwin Mundt. William E. Sandinee. Microbiology of Foods. W.H. Freeman and Co.

**RECOMMENDED READINGS:**
1. Stanbury, PF., Principles of Fermentation Technology. Whittaker, A and Hall, S.J 2nd Edition. Pergamon Press (1995).
2. Photis Papademas.Dairy Microbiology: A Practical Approach. CRC Press
3. Rao M.K..Food and Dairy Microbiology. Manglam Publishers
4. William Frazier. Food Microbiology. McGraw Hill Education
5. Jay, James M., Loessner, Martin J., Golden, David A. Modern Food Microbiology.Springer

**FS-MIC-OE-304(A): Human Physiology**

The main objective of this course is to enable a learner to get acquainted with the basic organization of the human body and human physiology. The learner will be able to understand the relationship among various organs and organ systems.

**Course Learning Outcomes:**

Upon successful completion of the course, the student will able to:

| CO1 | Understand the anatomy, physiology and functions of various cells and tissues, organization of cellular system of the human body. |
|------|------|
| CO2 | Understand the composition of blood, functioning of the circulatory, cardiovascular and lymphatic system. |
| CO3 | Explain the anatomy and physiology of gastrointestinal system. |
| CO4 | Explain the structure and functioning of kidney, formation of urine |
| CO5 | Explain the concept of communication in the body through nervous and endocrine system |
| CO6 | Describe about the organs involved in the respiratory system and the mechanism of breathing. |
| CO7 | Describe about the organs involved in the reproduction system and phages of reproduction. |

**Course Description**

**UNIT-I**

BASIC CELL PHYSIOLOGY: Organization of the human body (cell, tissue, organ and organ system)Cell-Introduction, Cell Organelles, Cell membrane, Movement of the substances and water through the cell membrane, Bioelectric potentials

BLOOD, LYMPH AND CIRCULATORY SYSTEM-Functions of Blood, hematopoiesis, erythropoiesis,granulocytes and agranulocytes,Macrophage system, Blood groups.Lymph and its role.

CIRCULATORY SYSTEM: Functional anatomy of the heart, Properties of cardiac muscles, Conducting system of the heart, Pressure changes during cardiac cycles, Capillary circulation, Arterial and venous blood pressure.

**UNIT-II**

GASTRO INTESTINAL SYSTEM(**Digestive system**): General structure of alimentary canal, Organs- Mouth, Pharynx, Oesophagus, Stomach, Small intestine, Large Intestine, Rectum. Glands and their secretion - Salivary, Liver, and Pancreas. Digestion of food.

RENAL PHYSIOLOGY- Structure of kidney- Nephrone, Bowman's capsule, renal tubule, Bladder, Ureters, urthera, Process of urine formation- glomerular filtrate, Reabsorption, mechanism of secretion, Concentrating and diluting mechanism of urine, Dialysis

RESPIRATORY SYSTEM- Upper and lower respiratory system, Organs involved, Mechanism of breathing, Regulation of respiration, Transport of gases, Hypoxia, Artificial ventilation.

**UNIT III**

REPRODUCTION SYSTEM: Organs (testis and ovary). Male primary and secondary reproductive organs - Testis, Scrotum, vas deferens, seminal vesicles, prostate gland, Urethera, penis. Female primary and secondary reproductive organs- Ovary, Fallopian tube, Uterus, Vagina. Phages of reproduction.

NERVOUS SYSTEM: Neurons, Central (brain and spinal cord) peripheral (somatic and Autonomic) system. Physiology of nervous system.

ENDOCRINE GLANDS(Hypothalamus, Pituitary, Pineal, Thyroid, Parathyroid, Adrenal, Pancreas, Thymus, Testes, Ovaries), their hormones and functions

**Scheme of Examination**

**Maximum Marks: 50 (40 External + 10 Internal)**                                 **Duration: 3 Hrs**

**Minimum Passing Marks:**          **13**

**External**

The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**

Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**

1. Guyton AC and Hall JE,Text book of medical physiology.
2. *Human Physiology: An Integrated Approach*, 6th Edition ☐by Dee Unglaub Silverthorn
3. JOHNSON, Leonard R, Essential Medical Physiology

4. Nordin M and Frankel VH, Basic biomechanics of the musculoskeleton system, Lippincot, Williams and Wilkins.
5. Human Biology and Health. Upper Saddle River, NJ: Pearson Prentice Hall. 1993. <u>ISBN</u> 0-13-981176-
6. Gray's anatomy: the anatomical basis of clinical practice. Editor-in-chief, Susan Standring (40th ed.). London: Churchill Livingstone. 2008. ISBN 978-0-8089-2371-8.

**RECOMMENDED READINGS:**
1. Atlas of Human Anatomy, Professional Edition, 7th Edition.
2. Ross & Wilson Anatomy and Physiology in Health and Illness, 13th Edition.
3. Clinical Anatomy: Applied Anatomy for Students and Junior Doctors, 14th Edition.
4. Gray's Anatomy for Students, 4th Edition.
5. Anatomy: A Photographic Atlas, 8th North American Edition.
6. Marieb Human Anatomy & Physiology Standalone Book, 10th Edition.
7. Human Anatomy & Physiology, 11th Edition.

**FS-MIC-CE-304(B): Basics of Medical Laboratory Techniques (BMLT)**

**Course Objectives:**

The course objectives are to provide knowledge and skills to understand the chemical properties of the biomolecules, their functions and biomedical importance, basic understanding of diseases and their pathogenesis, laboratory diagnostics, safety measures and various types of laboratory tests.

**Course Learning Outcomes:**

Upon successful completion of the course, students will have the knowledge and skills to:

| CO1 | Work efficiently in medical laboratories in India and abroad under different specialties and practice analytical testing processes. |
|---|---|
| CO2 | Follow prescribed procedures, and with adequate orientation, perform routine testing in chemistry, microbiology, immunohematology, hemostasis, and molecular diagnostics. |
| CO3 | Conduct analysis of body fluids/samples to diagnose different diseases. |
| CO4 | Conduct molecular analysis of chromosomal aberrations in leukemias and lymphomas, molecular diagnosis of genetic diseases and practice established safety measures. |
| CO5 | Demonstrate working of various instruments, process and formats of reporting in medical laboratory technology laboratory. |
| CO6 | Manage and maintain laboratory operations and human resources to ensure cost-effective, high-quality laboratory services |
| CO7 | Understand the application of molecular methods in clinical microbiology, and antimicrobial resistance. |
| CO8 | Practice quality assurance and performance improvement techniques for optimum laboratory analysis. Utilize information management systems to provide timely and accurate reporting of laboratory data. |

**Course Description**

**UNIT-I**

Analysis of amino acids, screening tests, quantitative tests, test for specific amino acids, determination of proteins in serum, plasma and CSF, determination of glucose in body fluids, glucose tolerance test, analysis of ketone bodies, method of estimation of lactate, pyruvate and glycated hemoglobin in blood, analytical methods for estimation of triglycerides, high density lipoproteins, low density lipoproteins, apolipoproteins.

Laboratory application of nucleic acid technologies to elucidate, diagnose, monitor disease state and to evaluate non-disease status, basic principles and techniques involving nucleic acid in relation to laboratory evaluation of disease, Clinical testing process, quality assurance, clinical validation and accreditation.

**UNIT-III**

Molecular analysis of chromosomal aberrations in leukemias and lymphomas, molecular diagnosis of genetic diseases, application of molecular methods in clinical microbiology, antimicrobial therapy; antimicrobial resistance, historical aspects advantage of DNA over traditional serology, DNA degradation and environmental damage, quality assurance, standard, databank, legal challenge.

## Scheme of Examination

**Maximum Marks: 50 (40 External + 10 Internal)**　　　　　　　　　　**Duration: 3 Hrs**
**Minimum Passing Marks:**　　　　**13**

**External**

The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**

Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**
1. Methods in Molecular Biology: Amino Acid Analysis Protocols By Catherine Cooper, Nicolle Packer and Keith Williams. Publisher: Humana Press
2. Medical Biochemistry [Paperback] By John Van Pilsum. Publsher: University of Minnesota Press.
3. Clinical Biochemistry: Metabolic and Clinical Aspects [Paperback] By William J. Marshall and Stephen K. Bangert. Publisher: Churchill Livingastone.
4. Clinical Chemistry: Techniques, Principles, Correlations (Bishop, Clinical Chemistry) [Hardcover] By Michael L Bishop, Edward P Fody and Larry E Schoeff. Publisher: Lippincott Williams and Wilkins
5. Nucleic Acid Amplification Technologies: Application to Disease Diagnosis [Hardcover] By H Olsvik (Editor), S Morse (Editor), O Lee (Editor). Publisher: Eaton Publishing, USA.
6. Chromosomal Alterations: Methods, Results and Importance in Human Health [Hardcover] By Gunter Obe and Vijayalaxmi. Publisher: Springer
7. Handbook of Hematologic Pathology (Diagnostic Pathology) [Hardcover] By Harold R. Schumacher, Sanford A. Stass and William A. Rock. Publisher: Marcel Dekker Inc.
8. Molecular Diagnosis of Genetic Diseases (Methods in Molecular Medicine) (Methods in Molecular Biology) (v. 1) [Hardcover] By Rob Elles. Publisher: Humana Press.
9. Color Atlas and Textbook of Diagnostic Microbiology [Hardcover] By Elmer W Koneman, Stephen D Allen, William M Janda, Paul C Schreckenberger and Washington C Winn. Publisher: Lippincott
10. Molecular Diagnostics: Promises and Possibilities [Hardcover] By Mousumi Debnath, Godavarthi B.K.S. Prasad and Prakash S. Bisen. Publisher: Springer

**RECOMMENDED READINGS:**
1. Henry, John Bernard, Todd Sanford and Davidson, 2002. Clinical diagnosis and management by laboratory methods. W.B. Saunders& Co.
2. Fischbach Francis A, 2003. Manual of laboratory and diagnostic tests. Philadelphia,J.B. Lippancott &Co, N.Y.
3. Gradwohls, 2000. Clinical laboratory methods and diagnosis ed.Alex.C. Sonnenwirth & Leonard Jarret.M.D.B.I.Publications, New Delhi.
4. Sood, R, 2005, Medical Laboratory methods and interpretation, Jaypee brothers medical publications, New Delhi.

## PRACTICALS

Study of coliform bacteria in  water samples from different sewage sources
Study of decolouration of distillery or textile industrial waste.
Study of microbial degradation of hydrocarbons(s) or pesticide(s).
Study of fungal degradation of wood.
Study of Bacterial interactions (antagonism etc)
Isolation and cultivation of *Azotobacter, Rhizobium, Azospirillum, Cyanobacteria, Actinomycetes, Mycorrhiza.*
Biofertilizer production using *Rhizobium*
Biofertilizer production using Mycorrhiza

Soil analysis for various parameters like moisture content, water holding capacity, Micro and macronutrients like carbon, nitrogen, carbonates etc

Determination of following enzyme activities in the soil sample: amylase, cellulose, xylanase, protease and phosphatase.

Laboratory methods for studying soilborne diseases

a. Isolation of soilborne pathogen

c. Chemical control of soilborne pathogens using acylanilide and alkyl phosphonates.

Bacterial diseases of food plants

a. Isolation of pathogenic bacteria from rotten vegetables and fruits

b. Biochemical and physiological tests for detection of pathogens in vegetables and fruits

To study normal micro-flora of Skin, Respiratory tract, Gastro-intestinal tract, uro-genital tract.

To study cultural characteristics of pathogenic bacteria on various selective and differential media.

To study pathogenicity of *Staphylococcus aureus* by coagulase test.

To study antimicrobial susceptibility using an octadisc.

To determine the minimal inhibitory concentration (MIC) of an antibiotic on bacteria and fungi

Determination of Blood group and Rh factor.Blood cell counts. Serological tests: Radio immuno-diffusion, Immuno-electrophoresis, DOT ELISA, Sandwich ELISA,

Ochterlony double diffusion, agglutination test, Fluorescent Antibody test.

Monitoring blood pressure, pulse rate, clotting time, bleeding time.

Haemoglobin estimation, erythrocyte sedimentation rate, packed cell volume. Prothrombin time, differential count.

Total red blood cell count, total white blood cell count, platelet count, eosinophilic count, reticulocyte count.

Monitoring blood sugar, urea, uric acid, creatinine.

Monitoring cholesterol, triglyceride, high density liporoteins, low density lipoproteins, very low density lipoproteins.

Estimation of sodium, potassium, calcium, chloride, bicarbonate, phosphorus and magnesium in biological fluids.

Collection of urine and blood, types of preservative, physical examination; volume, colour, odour, appearance, specific gravity and pH.

Reducing sugar-benedict test, protein: heat and acetic acid test, and sulfosalicylic acid method, ketone bodies-roth era's test, bile pigment (fouchet method), bile salt (hay's test), urobilinogen-ehrlich aldehyde test and bence jones protein test, renal clearance test-urea, creatine, test for mucin.

Antigen antibody assay, ELISA tests, immuno- electrophoresis.

## Semester 4

| Theory Papers | Duration | Max. Marks | |
|---|---|---|---|
| FS-MIC-CC-401 | | 3 Hrs. | 40 |
| FS-MIC-CC-402 | | 3 Hrs. | 40 |
| FS-MIC-CE-403 | 10 min Viva-voce for the project work | 40 | |
| FS-MIC-OE -404(A) | | | |
| OR | | 3 Hrs. | 40 |
| FS-MIC-OE -404(A) | | | |
| Combined Practical | | 1 Day (6Hrs) | 75 |

**\*Each student shall give a presentation on his/her Research project/Review work of 10 min**

**Students are advised to complete Research project preferably from some outside research institute/industry or otherwise in the University in the first 45 days starting from the beginning of the session.**

### FS-MIC-CC-401: Bioinformatics and Computer Applications

#### Course Objectives:

The objectives of this course are to provide theory and practical experience of the use of common computational tools and databases which facilitate investigation of biological molecules (DNA, RNA and protein) and evolution-related concepts.

#### Course Level Learning Outcomes:

Upon successful completion of the course, students will have the knowledge and skills to:

| CO1 | At the end of the course, the student will be able to apply basic principles of biology and computer science to address complex biological sequence problems. This allied course introduces the students various concepts to assess and analyze biological data. |
|---|---|

| CO2 | It deals with understanding the molecular aspects of biology. It majorly emphasizes the concepts of central dogma of molecular biology spanning from DNA replication till protein synthesis and reverse transcription. |
|---|---|
| CO3 | The course talks about primary, secondary and tertiary databases used in bioinformatics and will train the students in the use of databases for finding and retrieval of biological sequences. |
| CO4 | Students should be able to develop an understanding of the theory of various computational tools used in bioinformatics and will gain working knowledge of these computational tools and methods. |
| CO5 | This course will help students to learn the basics of mapping, genome sequencing, and genome sequence assembly, genome annotation and whole genome alignment. |
| CO6 | The course is a skill based paper that introduces the students to the basics of computer operations. The student is imparted with knowledge on both hardware and software and operating systems. The student has a better understanding on the use of computers for various microbiological/biological applications. |

## Course Description
### UNIT-I

Bioinformatics: Introduction, objectives. Bioinformatics and data analysis. Database concept, types of databases. Microbiological and Virology databases. Knowledge of basic algorithms in computational biology, Python for Bioinformatics: Basic concepts and application in biological sequence analysis.

### UNIT-II

Metabolic pathway engineering. Finding and retrieving sequences from databases. Sequence alignment: pairwise and multiple sequence, evolutionary basis, sequence homology versus sequence similarity, sequence similarity versus sequence identity. Protein structural visualization, protein structure comparison, protein expression analysis, protein sorting, Gene phylogeny versus species phylogeny, forms of tree representation, why finding a true tree is difficult. phylogenetic tree construction methods and programs.

### UNIT-III

Computers and their organization, hardware, software, operating system, R environment for computational biology and bioinformatics, introduction to graphics package, application packages for microbiologists, genome mapping, genome sequencing, genome sequence assembly, genome annotation.

## Scheme of Examination

**Maximum Marks: 50 (40 External + 10 Internal)**                    **Duration: 3 Hrs**
**Minimum Passing Marks:          13**

**External**
The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**
Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**
1. Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins by Baxevanis A.D. and Ouellette, Third Edition. John Wiley and Son Inc., 2005.
2. Bioinformatics Sequence and Genome Analysis by Mount D.W., CSHL Press, 2004.
3. Introduction to Bioinformatics by Tramontano A., Chapman & Hall/CRC, 2007.
4. Understanding Bioinformatics by Zvelebil, M. and Baum, Chapman & Hall/CRC, 2008.

5.   Bioinformatics: Methods Express By: Paul H Dear, Scion Publishing Ltd, 2007
6.   Bioinformatics: Sequence and Genome Analysis by David W. Mount, Cold Spring Harbor Laboratory, 2004.

**RECOMMENDED READINGS:**
1.   W.J. Ewens, Gregory Grant,(2005). Statistical Methods in Bioinformatics: An Introduction (Statistics for Biology & Health), Springer
2.   Bryan Bergeron,( 2003).Bioinformatics Computing First Indian Edition, Prentice Hall
3.   Cynthia Gibas & Per Jambeck (2001). Developing Bioinformatics Computer Skills: Shroff Publishers & Distributors Pvt. Ltd (O'Reilly), Mumbai
4.   HH Rashidi & LK Buehler (2002). Bioinformatics Basics: Applications in Biological Science and Medicine, CRC Press, London
5.   Des Higgins & Willie Taylor (2002). Bioinformatics: Sequence, structure and databanks, Oxford University Pres

## FS-MIC-CC-402: Microbial Ecology and Environmental Biotechnology
### Course Objectives:

The main objective of this course is to impart the basic and advance knowledge about the microbial communities inhabiting in diverse environments, their role in environment and ecosystem wellness and interaction with various type of pollutants. The learner will be acquainted with the concepts of aquatic microbiology, aero microbiology, use of microbial population in microbial waste recycling and bioremediation, rumen microbiology and other related topics.

### Course Level Learning Outcomes:

Upon successful completion of the course, the learner will be able to :

| CO1 | explain various concepts of aero and aquatic microbiology. |
|---|---|
| CO2 | describe advances in the field of environmental microbiology and the role of microbes in mitigating environment pollution. |
| CO3 | prepare and perform sampling and microbial analyses to determine the microbial community composition in various environments. |
| CO4 | describe Inter specie interactions among the microbes. |
| CO5 | understand the role of microbes in bio-deterioration and biodegradation of various natural and manmade things and apply this concept in the field. |
| CO6 | describe the role of microbes in solid and liquid waste management, gaining knowledge of various methods employed in sewage treatment and solid waste treatment. |
| CO7 | Understand the concept of rumen microbiology, microorganism based Oxidative transformations. |

### Course Description
#### UNIT-I

**Aero Microbiology :**Droplet nuclei, aerosol, assessment of air quality, solid - liquid impingement methods, assessment of air quality, brief account of air- borne microbes – bacteria, fungi, and viruses, their diseases and preventive measures.

**Aquatic microbiology:** Water ecosystems - types, fresh water (ponds, lake, streams) - marine habitats (estuaries, mangroves, deep sea, hydrothermal vents, saltpans, coral-reefs). Potability of water- microbial assessment of water quality- water purification. Eutrophication. Brief account of major water borne diseases.

**Extreme environments and extremophilic microbes**: Habitats, diversity, adaptations and potential applications of oligotrophs, thermophiles, psychrophiles, metallophiles,acidophiles, alkaliphiles and halophiles.

#### UNIT-II

Inter species interactions-microbial behavior in ecosystems: Microbial Antagonism, competition, commensalisms, synergism, parasitism and predation. Gause and Hardin's principles of competition.

Rumen microbiology, digestion, fermentation and detoxification by microbes, factors influencing rumen microbes.

Plant-microbe symbiosis, microbial antagonism, biofilms and their biotechnological applications. Bio-fertilizers and Biopesticides, carriers for inoculants: types and characteristics, strain selection of bacteria. Plant growth promoting rhizobacteria, (PGPR), biocontrol agents

Understanding microbial diversity in the environment by culture-dependent and culture-independent approaches

Oxidative transformation of metals: sulfur oxidation, iron oxidation, ammonia oxidation and hydrogen oxidation.

#### UNIT-III

**Waste water treatment :**Wastes - types- solid and liquid wastes characterization. Sewage treatments methods - physical, chemical, biological (aerobic- anaerobic) ; primary, secondary and tertiary treatments (trickling; activated sludge, oxidation pond, oxidation ditch). Treatment of industrial effluents (distillery, textile, pulp and paper), methods to detect various pollutants (metals, sediments, toxin and organic matters).

Subterranean microbes and bioremediation. Biodeterioration and biodegradation of paints, plastics, rubber, paper, leather, wood, wool, degradation of xenobiotics, pesticides and polymers.

Microbial leaching and oxidation of minerals (copper bioleaching, cobalt bioleaching, Uranium bioleaching, biooxidation of gold ores, Nickel leaching, acid mine drainage). Microbial enhanced oil recovery.

## Scheme of Examination

**Maximum Marks: 50 (40 External + 10 Internal)**          **Duration: 3 Hrs**

**Minimum Passing Marks:**      **13**

**External**

The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**

Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**

1. Microbial Ecology By Atlas R.M., Bartha R., Benjamin Cummings Publishing Co, Redwood City, CA.,1993.
2. Environmental Microbiology by A.H. Varnam & M.G. Evans, Manson Publishing Ltd., 2000.
3. Manual of Environmental Microbiology by Christon J. Hurst, Ronald L. Crawford, Jay L. Garland, DavidA. Lipson, Aaron L. Mills, ASM Press, 2007.
4. Environmental Microbiology by W.D. Grant & P.E. Long, Kluwer Academic Publishers, 1981.
   5. Assessing Ecological Risks of Biotechnology Lev R. Ginzburg
   6. Environmental biotechnology G. M. Evans and J. C. Furlong
   7. Environmental biotechnology A. Scragg, Oxford
   8. Environmental Microbiology – A Laboratory Manual Pepper et. Al
   9. Genetic control of environmental pollutants Gilbert & Alexander

**RECOMMENDED READINGS:**

   1. Experimental ecology R.M. Atlas
   2. Handbook of water and waste water treatment Technology Paul
   3. Waste Water Treatment Arceivala
   4. Environmental Microbiology by A.H. Varnam & M.G. Evans, Manson Publishing Ltd., 2000.
   5. Manual of Environmental Microbiology by Christon J. Hurst, Ronald L. Crawford, Jay L. Garland, David A. Lipson, Aaron L. Mills, ASM Press, 2007.
   6. Environmental Microbiology by W.D. Grant & P.E. Long, Kluwer Academic Pu
   7. Ewesis ET. Al. 1998. Bioremediation Principles. Mac Graw Hill.
   **8.** Dart. R.K. and Shettron R.J. 1980. Microbiological aspects of pollution control. 2 ed.

### FS-MIC-CE-403(A): Research Project

#### Course Objectives:

To develop the skills of preparing and conducting independent research and/or reviewing the research work done on the selected topic.

#### Course level learning outcomes:

This will develop the students' ability to apply the tools and techniques of microbiology in conducting independent research/review.

#### Scheme of examination

The student shall prepare a report of his/her work carried out as mentioned below and shall present it to the external examiner. The examiner will evaluate the work carried out and shall award the marks accordingly.

**Maximum Marks:**      **40**                 **Duration: 10 min per student**

**Minimum Passing Marks:**      **15**

The student will select a topic of research in consultation with his/her supervisor/guide to do a research work, write a review or carry out a case study on any topic related to microbiology or allied subjects.

### FS-MIC-CE-403(B): Review

#### Course Objectives:

To develop the skills of preparing and conducting independent research and/or reviewing the research work done on the selected topic.

#### Course level learning outcomes:

This will develop the students' ability to apply the tools and techniques of microbiology in conducting independent research/review.

The student shall prepare a report of his/her work carried out as mentioned below and shall present it to the external examiner. The examiner will evaluate the work carried out and shall award the marks accordingly.

**Maximum Marks:**     **40**           **Duration: 10 min per student**
**Minimum Passing Marks:**     **15**

The student will select a topic of research in consultation with his/her supervisor/guide to do a research work, write a review or carry out a case study on any topic related to microbiology or allied subjects.

## FS-MIC-OE-404(A): Biostatistics
### Course Objective

This paper develops concepts about types of data observed in biological experiments, its handling and processing. It develops concepts of hypothesis and formulation of experiments. It gives understanding of various statistical operations needed to carryout and process the biological data.

### Course Level Learning Outcomes:

Upon successful completion of the course, the learner will be able to :

| CO1 | Able to collect, handle, process and present the biological data. |
|-----|------------------------------------------------------------------|
| CO2 | Apply the principles of statistics on biological experiments. |
| CO3 | Learn about how to collect data using different sampling methods |
| CO4 | Learn to present data in various forms like tabular, graphical, pictorial, etc. |
| CO5 | Learn the use of Simple Probability methods, Regression and Correlation, and simple linear regression in biological research. |
| CO6 | Learn the use of use of partial correlation and partial covariance in biological research. |
| CO7 | Understand about Count data: examples of count data (bacterial cell count, radioactivity, colony and plaque counts), statistical treatment to count data |
| CO8 | Statistical basis of biological assays: Response-Dose relationship, direct and indirect assay, statistical analysis of LD50. |

### Course Description
#### UNIT-I

Definition of statistics, symbols, notations and terminology of statistics: Sampling and estimation of population parameters, Random sampling, Sampling size in random sampling, stratified two stage cluster and sequential sampling, Bias in sampling Presentation of research results, Graphic presentation.

#### UNIT-II

Interval Data: Construction of a histogram, interpretations of histogram, the normal distribution, the mean, mode, median and standard deviation, representing the normal curve, Chi square test, goodness of fit. Count data: examples of count data (bacterial cell count, radioactivity, colony and plaque counts), statistical treatment to count data. Poisson distribution, Standard error, confidence limits of counts.

#### UNIT-III

Simple Probability: Regression and Correlation, simple linear regression, Coefficient of determination. Brief introduction to the need and application on curvilinear and multiple regression. Use of partial correlation and partial covariance. Detecting association between a pair of species. Cole's measure of association and point correlation coefficient.

Statistical basis of biological assays: Response-Dose relationship, direct and indirect assay, statistical analysis of LD50.

### Scheme of Examination

**Maximum Marks: 50 (40 External + 10 Internal)**         **Duration: 3 Hrs**
**Minimum Passing Marks:**     **13**

**External**

The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).

**Internal**

Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

**REQUIRED READINGS:**

1. Sampling Techniques by Cochran W. G., Wiley estern Ltd, New Delhi.
2. Fundamentals of Biostatistics, by Irfan Ali Khan and Atiya Khanum, (2nd edition). Ukaaz Publications, Hyderabad.
3. Introduction to probability theory and its applications, by Felller W., Asia Publishing House, Mumbai.
4. An introduction to Biostatistics by Glover T. and Mitchell K., McGraw-Hill , N.Y; 2002.
5. Fundamentals of statistics. Goon, Gupta and Dasgupta- World Press, Kolkota.
6. Design and analysis of experiments by Montgomery D. C., John Wiley and Sons.
7. Biostatistics, a foundation for analysis in the health Sciences, (7$^{th}$ edition), Wayne Daniel; 2007.

**RECOMMENDED READINGS:**

1. Scrimshaw NS and Gleason GR 1992. Rapid assessment procedures. Quantitative methodologies for planning and evaluation of health related programs. International Nutrition Foundation for Developing Countries, Boston.
2. Van Maanen 1983. Quantitative methodology. Sage publications.
3. Cook TD and Reichardt CS 1979. Qualitative and quantitative methods in evaluation research. Sage Pub., London.
4. Creswell J 1994. Research design: Qualitative and quantitative approaches. Thousand Oaks. CA, Sage Pub.
5. Denzin NK and Lincoln YS 1994. Handbook of qualitative research. Sage pub.
6. Mienert CL 1986. Clinical trials: Design, conduct and analysis. Oxford Univ Press, New York.
7. Arora PN & Malhon PK (1996). Biostatistics Imalaya Publishing House, Mumbai.
8. Sokal & Rohif (1973). Introduction to Biostatistics, Toppan Co. Japan.
9. Stanton A & Clantz, Primer of Biostatistics (2005). The McGraw Hill Inc., New YorK

### FS-MIC-OE-404(B): Microorganisms and Health

### Course objectives:

This course gives basic knowledge about the microorganisms and their role in the life of human beings. It provides information about the locations of microorganism in the environment. It also gives information about how microbes are exploited for human well being.

### Course Level Learning Outcomes:

Upon successful completion of the course, the learner will be able to :

| CO1 | Able to understand the basics of microorganisms. |
|---|---|
| CO2 | Able to know about the habitats of microorganisms. |
| CO3 | Learn about life, various places where living organisms are found and limits of Life on earth. |
| CO4 | Learn to understand the role of Human microbiome in good health and preventinn of infectious diseases. |
| CO5 | Know about the biological (Germs) terror, its origin, consequences and possible control through vigilance and Laws. |
| CO6 | Learn about how to prevent infectious diseases through vaccination. |
| CO7 | Learn about Antibiotic resistance and its control |

## Course Description
### Unit I
What is life? Where can life exist? Limits of Life on earth . Invisible life. Microorganisms, what are they? Types of Microorganism, Where do they live? What do they do? Microorganisms and man, the friends and foes.
### Unit II
Human microbiome, Preventing infectious diseases, New crop of diseases, Legionnaires disease, AIDS, Swine Flu, SARS, MERS, Ebola, Zica, West Nile Virus.
### Unit III
Germs and terror, Prevention of infections, Vaccines and vaccine schedules, Return of the old foes: Antibiotic resistance

## Scheme of Examination
**Maximum Marks: 50 (40 External + 10 Internal)**                                **Duration: 3 Hrs**
**Minimum Passing Marks:        13**
**External**
The question paper will consist of three Sections: A, B and C. Section A will consist of 10 questions (at least 3 questions from each unit of syllabus). Section B will consist of 9 questions (3 questions from each unit of syllabus). Section C will consist of 6 questions (2 questions from each unit of the syllabus).
**Internal**
Internal exam shall comprise Theory Exam (5 marks), Seminar Presentation (3 marks) and Class Performance (2 marks).

### REQUIRED READINGS:
1.  Stanier RY, Ingraham J.L., Wheelis M.L., Painter P.R. 1999. General Microbiology. MacMillan Education Ltd., London.
**2.**  Schlegel. General Microbiology. Cambridge University Press, Cambridge.
3.  Topley and Wilson 1995. Text book on Principles of Bacteriology, Virology and Immunology. Edward Arnold, London.
4.  Ananthnarayanan R and Jayaram C.K. 1997.Textbook of Microbiology. Orient Longman.
5.  Mackie and McCartney. 1996. Medical Microbiology. Vol.1. Microbial Infection, Vol. 2. Practical Medical Microbiology. Churchill Livingstone.
6.  Shanson DC. Wright PSG1982. Microbiology in Clinical Practice. 6. Baron EJ, Peterson LR and Finegold SM. 1990. Bailey and Scott's Diagnostic Microbiology. Mosby

### RECOMMENDED READINGS
1. Adams MR and Moss MO 1995. Food Microbiology. Royal Society of Chemistry Pub., Cambridge.
2. Robinson RK. 1990. Dairy Microbiology. Elsevier Applied Sciences, London.
4. Banwart GJ 1989. Basic Food Microbiology. CBS Pub and distributors, Delhi.
5. Hobbs BC and Roberts D 1993. Food Poisoning and Food Hygiene. Edward Arnold (A division of Hodder and Stoughton) London.

## Teaching Learning Process
- Lectures
- Discussions
- Simulations
- Role Playing
- Participative Learning
- Interactive Sessions
- Seminars
- Research-based Learning/Dissertation or Project Work
- Technology-embedded Learning

## Blended Learning
Blended Learning is a pedagogical approach that combines face-to-face classroom methods with computer-mediated activities in the process of teaching and learning. It has been decided that blended learning be taken recourse to only if such need arises (unfortunately). To face such a situation, the teacher be kept in a ready to use mode. Hence, only 10% teaching be done through blended learning after deliberations of the departmental level.

- Continuous Comprehensive Evaluation at regular after achievement of each Course-level learning outcome
- Formative Assessment on the basis of activities of a learner throughout the programme instead of one-time assessment
- Oral Examinations to test presentation and communication skills
- Open Book Examination for better understanding and application of the knowledge acquired
- Group Examinations on Problem solving exercises
- Seminar Presentations
- Review of Literature
- Collaborative Assignments

## Evaluation

**Internal Assessment –** Midterm Examination    10%

         Term Paper      5%

         Students Participation    5%

**External Assessment –**                       80%

**PASS CRITERIA**

Each theory paper shall be of 50 marks (40 Paper +10 Internal). For passing in each theory examination, a candidate is required to obtain 25% marks in individual paper and 36% marks in aggregate of all theory papers and 36% marks separately in the practical examination.

## CLASSIFICATION OF SUCCESSFUL STUDENTS

| Division | Total Marks |
|---|---|
| First Division | 60% and above |
| Second Division | Above 48 % and below 60 % |
| Pass | Above 36 % and below 48 % |
| Fail | Below 36 % |
| BACKLOG | As per University Norms |

## Examination Paper Pattern

There shall be three Sections:

**Section One** shall comprise 10 Questions of 1 mark each (All Compulsory) selecting at least 3 questions from each Unit. Each question shall carry equal marks.

**Section Two** shall comprise 9 Questions selecting at least 3 questions from each unit. The student shall at least attempt 5 questions of 3 marks each.

**Section Three** shall comprise 6 questions. The student shall attempt 3 question of 5 marks each, selecting at least 1 question from each unit.

Questions of section I, II and III are to be answered in 50, 250 and 500 words respectively. The duration of each course examination shall be 3 hours. On the basis of the marks obtained the student shall be awarded SGPA and CGPA on the basis of the formula specified in the CBCS rules.

# M. G. S. UNIVERISTY, BIKANER

# SYLLABUS

# SCHEME OF EXAMINATION AND

# COURSES OF STUDY

## PGDYN YOGA 2021-22

# Maharaja Ganga Singh University

# Bikaner

# Maharaja Ganga Singh University

### C.E.S.D | Center for Entrepreneurship & Skill Development

## YOGA

**Center for Entrepreneurship and Skill Development (CESD)**

**Programme Structure and Codification of Papers**
**Session- 2021-22**

| Paper Code | Post Graduate Diploma in Yoga and Naturopathy | Max. Internal Marks | Max. Theory/ Practical (External) Marks | Total Marks |
|---|---|---|---|---|
| PGDYN-1 | Foundation of Yoga | 25 | 75 | 100 |
| PGDYN-2 | Basics of Naturopathy | 25 | 75 | 100 |
| PGDYN-3 | Human Anatomy & Physiology | 25 | 75 | 100 |
| PGDYN-4 | Yogic Management for Diseases | 25 | 75 | 100 |
| PGDYN-P | Practical | 50 | 100 | 150 |
| PGDYN-D | Dissertation/Project Work/ clinical project / case study / & Viva | | 50 | 50 |
| | **Total of Marks** | **150** | **450** | **600** |

**Name of the Course:**
Post Graduate Diploma in Yoga and Naturopathy

**Objectives:**
- To cater Professional knowledge and imparting higher education in Yoga and Naturopathy.
- To understand the origin and historical development of Yoga and Naturopathy.
- To impart training and teaching with respect to holistic development of human personality.

**Duration of the Course:**
The Course shall be of One Year duration.

**Scheme of the Papers and Marks Distribution:**
The PGDYN is of one year duration full time annual course. The course will have four theory papers of 100 marks (75 external + 25 internal marks) each, one Practical paper of 150 marks (100 external + 50 internal Marks), & a Dissertation/ Project work/ training/review/clinical project/internship/case study & Viva of 50 marks. Practical paper & Dissertation/ Project work etc, Viva will be evaluated at the end of course by external & internal examiner. An educational tour may be organized for PG diploma students within or outside the State under the supervision of faculty members.

Scheme of Examination:
1. English/Hindi shall be the medium of instructions and examination.
2. There will be yearend examination. The yearend examinations, evaluation, publication of results, award of marks statements and award of diploma shall be undertaken by MGS University, Bikaner.
3. The system of evaluation shall be as follows:
   - Each Theory paper will carry 100marks (75marks External + 25marks Internal). The evaluation scheme shall comprise external evaluation of 75 marks and internal evaluation of 25 marks.
   - Practical paper will carry 150 marks (100 External +50Internal).
   - Dissertation/ Project work/training/review/clinical project/internship/case study & Viva of 50 marks.
   
   Any student who fails to participate in classes, viva-voce, practical work & in submitting dissertation/project work etc. will be debarred from appearing in the end of main examination.
4. The duration of written examination for each paper shall be of three hours and Practical examination shall be for one day duration.
5. The minimum attendance required by a candidate will be as per the University rules.
   With regards to the Dissertation/project/training/review/clinical project/internship/case study, the scheme of evaluation shall be as follows:
6. The candidate has to submit report/thesis/dissertation/case study in a Hard/spiral bound form in three copies and appear in viva which would be evaluated by an External & Internal examiner. Total marks for Project/case studies/training/dissertation/internship shall be -50 marks
7. The candidate has to secure at least 36% marks to pass the examination and 25% marks in each individual paper. Even if he/she fails in one paper/course/practical/dissertation is he/she will be declared fail. He/she however shall be allowed one more chance to appear in the examinations as ex-student. In such a case, the marks of practical's shall be carried forward for the said purpose and as per Maharaja Ganga Singh University rules and regulations.

**Affiliation:**
The Programme shall be governed by the CESD, of Maharaja Ganga Singh University, Bikaner (Raj.)

# Post Graduate Diploma in Yoga and Naturopathy (1 Year)

**Marking Scheme for External**

| Paper Code | Theory Papers | Duration | Max. Marks |
|---|---|---|---|
| PGDYN-1 | Foundation of Yoga | 3 Hrs. | 75 |
| PGDYN-2 | Basics of Naturopathy | 3 Hrs. | 75 |
| PGDYN-3 | Human Anatomy & Physiology | 3 Hrs. | 75 |
| PGDYN-4 | Yogic management for Diseases | 3 Hrs. | 75 |
| PGDYN-P | Practical | | 100 |
| PGDYN-D | Dissertation /Project Work/ clinical project /case study/& Viva | 1 Day (6Hrs) | 50 |

## Detailed Syllabus for Post Graduate Diploma in Yoga and Naturopathy

## PGDYN-1: Foundation of Yoga

**Instructions to Paper Setters (Theory):**

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

### Unit- I

Historical and mythological aspects leading to the origin of yoga, history and development of yoga, definition of yoga in different yoga text and school of thought. yoga according to different veda and upanishad. general introduction of shat darshan with special reference to yoga.

### Unit- II

Introduction, meaning and definition of yoga according to patanjali. concept of chitta,chitt bhumis,chitt vritis,chitt vriti nirodhopaya, concept of ishwara, chitta vikshepas (antaryas), chitta prasadanam, type of samadhi

### Unit- III

Kleshes, kriya yog, panch klesha, ashtanga yoga (yama, niyama, asana, pranayama, prathyahara, dharna, dhayana, samadhi)

**Suggested reading:**

1. Swami Inanananda- Philosophy of yoga, Shri Ramakrishna Ashram, Mysore
2. Patanjali Yoga Sutra-Dr. Karnbetkar Lonavala.
3. Sing Lalan Prasad. Tntra, concept publishing Company, Delhi – 1976
4. Rajkumari pandey- Bhartiya yoga prampara ke vividha Ayama Radha Publication, Delhi- 1993
5. Fenerstein George. The yoga Tradition: Its History, Literature, philosophy Bhavana Books and prints, Delhi 2002.
6. Patanjali Yog- Pradeep, Omanand Tirth.
7. Yog darshan – Geeta press Gorakhpur

## PGDYN-2: Basics of Naturopathy

**Instructions to Paper Setters (Theory):**

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

### Unit-I

Definition and principal of naturopathy, historical development of naturopathy, introduction of indian naturopathy, life sketch and contribution of eminent naturopaths- Mahatma Gandhi (father of Indian naturopathy), Vitthal Das Modi, Dr. Lindlhar.

### Unit- II

Introduction of all naturopathy tools, alternative system of therapy- introduction, meaning and various methods, therapy by panch tatva sadhana (aakash, vayu, agani, jal, prathvi), methods of naturopathy: fasting therapy- limitation, method and benefits, deep breathing, breathing pratices, morning walk etc

### Unit III

Sun Ray's therapy- limitation, method and benefits, chromo therapy- limitation, method and benefits, colour therapy- limitation, method and benefits, hydro therapy- limitation, method and benefits, mud therapy-limitation, method and benefits, diet according naturopathy

**Suggested reading:**

1. K.S. Joshi, Speaking of Yoga & Nature- Cure Therapy, Sterling Publishers Private Limited (1991)
2. M.M.Bhamgara: The Human Body: Nature's Amazing Creation, Bipin Parekh, Mumbai (2004)

3. Parakrutik Ayuivijnana- Dr. Jindal- Republication of Kalyana Anka Arogya Seva Prakasham, Modinagar.
4. History and Philosophy of Nature Cure by S.J. Singh
5. Prachina Vangamaya Me Prakrutika Chikitsa-Swami Ananta Bharati, CCRYN, New Delhi.
6. Prakratik chikitsa kai siddant,Dr.Jindal

## PGDYN-3: Human Anatomy & Physiology

**Instructions to Paper Setters (Theory):**

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

### Unit-I

**Respiratory system**- Definition of respiration, structure and function, mechanism of respiration, exchange of gases, oxygen transportation, and co-transportation of respiration.

**Skeletal system -** Introduction of skeletal system, function of skeletal system. Types of joints, composition of bone, Types of bones, vertebral column of human body.

**Endocrine system** – Endocrine gland – structure , function, secretion , regulation of hormonal secretion, mechanism of action of hormone , Emphasis on physiology of diabetes and stress hormones, physiological functions and abnormalities in secretion of pituitary , thyroid , parathyroid , hormones, adrenal and reproductive hormones. Disorders of endocrine glands .

### Unit-II

**Digestive system** - definition of digestion, structure and function, mechanism of absorption of various product of digestive system control of digestion in various part of alimentary, hormonal control of digestive system.

**Muscular system** - Types of muscles, Theory of contraction, categories of muscles, and properties of muscles.

**Circulatory system**- structure and function of heart and blood vessels, cardiac cycle, regulation of cardiac output, blood pressure and factor affecting it, Hypertension. Blood & lymph-composition of blood, blood cells, function of blood, lymph, composition of lymph & functions

### Unit-III
.
**Nervous System** – Definitions, Role of Nervous System , Structure of neuron , Type of neuron , Morphological and function , Conduction of nervous system (Brain & Spinal cord) Peripheral nervous system , Autonomic nervous system. Immune System - Definition, types of Immunity

**Excretory System** – Definition , Anatomy & Physiology of Kidneys , Structure and function of nephron , Mechanism of urine formation , Regulation of urine formation  Sense organ – Structure & Functions ( Eye , Skin, Ear, Nose and  Tongue)  Physiology of different sense organ

**Reproductive system** – Definition, Types of Reproductive, male reproductive system, Female reproductive system, menstrual cycle, Changes during Pregnancy.

**Suggested reading:**

1. A  Glimpse of Human Body – Dr Shirley Telles.
2. Human Anatomy & physiology – Dr. Vrinda Singh
3. Guyton A.C (1985): Function of Human Body 4th Edition
4. Human Physiology – Chattergee C.C (1992)
5. Text book of Physiology – Jain A.K.

# PGDYN-4: Yogic management for Diseases

**Instructions to Paper Setters (Theory):**

The  paper  is  divided  into  three  units.  The  question  paper  will  consist  of  A,  B  and  C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2  marks  each).  B  part  will  consist  of  nine  questions  (three  questions  from  each  unit)  and students  are  required  to  attempt  five  questions  (5  marks  each)  selecting  at  least  1  question  from each  unit.  C  part  will  consist  of  six  questions  (2  questions  from  each  unit  of  syllabus)  and students  are  required  to  attempt  three  questions  (10  marks  each)  selecting  1  question  from  each unit.

## Unit- I

A Comprehensive study of the definition, classification, types, sign, symptom and yoga therapy for diseases of the following system through IAYT (integrated approach of yoga theraphy) & Panch Kosha:

**Respiratory system-** Nasal Allergy and Asthma.

**Cardiovascular system-** Hypertension and coronary artery diseases, Psychiatry Anxiety, depressive neurosis, Insomnia, phobia, OCD (Obsessive).

## Unit-II

A Comprehensive study of the definition, classification, types, sign, symptom and yoga therapy for diseases of the following system through IAYT (integrated approach of yoga theraphy) & Panch Kosha:

**Digestive system-** hyperacidity, Irritable bowel syndrome constipation, Gas (Flatulence).

**Musculo-skeletal system** -  Arthritis, Back pain, Ankylosing Spondylitis

## Unit III

A Comprehensive study of the definition, classification, types, sign, symptom and yoga therapy for diseases of the following system through IAYT (integrated approach of yoga theraphy) & Panch Kosha:

**Nervous system**-Epilepsy, migraine, Endocrine System-  Diabetes, Obesity, Thyroid (Hypo & Hyper), Special senses -  Eyes (Error of Refraction).

**Reproductive system-**   Infertility, Menstrual disorder, Role of stress in problems of Pregnancy, Menopause.

, **Reference Books**
1. Yoga for common ailments   series published by  svyp
2. Yoga therapy- by swami kuvalayanand, Lonavala
3. Yoga for different ailments  Robin monro, Nagarathna & Nagendra.
4. Light on pranayama  B.K.S. Iyenger
5. Bandh & madras swami  geetananda.
6. PPH- SVYP   Bangalore

## PGDYN-P: Practical

1.  Prayers
2.  Chanting Vyas Pushpanjali – SVYASA ( Raj Yoga, Bhakti Yoga, Karma Yoga, Gyan Yoga evm Mantra Chanting )
3.  Surya Namaskar
4.  Asanas ( Basic set of asana followed by S-vyasa  )
5.  Pranayama ( Anolom-Vilom pranayama ,Cooling Pranayama, Bharamari, Ujjai,Sectional Breathing, )
6.  Bandhas & Mudras
7.  Shudhi Kiryas   ( Shat karma )
8.  Meditation        - Om Meditation, Nadanusandana
9.   Relaxation Technique   - IRT,QRT,DRT
10. IAYT for common ailments

## PGDYN-D: Dissertation /Project Work/clinical project/ case study & Viva

Dissertation/Project Work/Training/Clinical project /Case study (Min. 8 to 10 Cases) /Presentation & Viva given from above syllabus.
- Dissertation/project Work submitted by the students as  per direction by Teachers.
- Presentation
- Viva

**Suggested reading:**

1. Promotion of Positive health (Dr. H.R.Nagendra)
2. Pranayama (Kala & Vigyan) (Dr. H.R.Nagendra)
3. Vyas Pushpanjali (SVYP) (Dr. H.R.Nagendra)
4. SMET (SVYP, Dr. H.R.Nagendra) For the common ailments all the SVYP, Disease Books

# MYS-1: Philosophical Background of Yoga

## Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

## Unit- I

General Introduction of Sankhya Philosophy, Theory of causation, forms of satkaryavada, prakrti and it gunas, evolution and arguments for its existence, characteristic of prakrti, objection against prakrti.Purusa, and its gunas, arguments for its existence, plurality of purusas, relationship between prakriti and purusa, theory of bondage and liberation, types of liberation, practices of yoga.

## Unit- II

Geetakeanusaratmakaswaroop, shitha- pragya (ch.II) karma sidhant, Dharamkaswaroop (ch.III), Gyanki again (ch.IV), Sanyaaskaswaroop, Moksha (ch.V), Brahmagyankaupaya, AbhyaasaurBairagya, Dhyana (ch.IV), Maya kaswaroop (ch.VII), Nishkam karma yoga, Bhakti yoga, Gyana yoga (ch.XII), praviti&Nivriti (ch.XIV),

## Unit- III

General introduction of Advaita Vedanta, Conception of absolute [Brahman], Conception of soul and individual soul, the nature of soul and individual soul, three states of Jiva, the relations between jiva and Brahman, three bodies of the jiva.Theory of world- Three grades of existence, [Satya], Theory of Maya, functions of Maya, characteristics of Maya, theory of causations-vivartvada, conceptions of God, the proof of existence God Theory of Bondage and liberation-concept, meaning, types of karma, knowledge and action [karma] knowledge and liberation.

**Reference Books:**
- ShriMadnjagwatGeetaBhashya – AcharyaSankar
- ShriMadnjagwatGeeta- Ramsukh das maharaj
- SankhayaTatvakaumudi – vachaspati Mishra
- Sankhyakarika  - Ishwor Krishna Virchit
- H.P. Sinha-  Outlie of Indian Philosophy
- N.K. Devraj – Indian Philosophy

- C.D. Sharny – A crtical survey of Indian Philosophy.
- J.S. Vinayaka - Indian philosophy
- H.P. Sinha - Indian Philosophy
- डॉ. डी.एन. सिंह  अद्वेतऔरविषिष्टाद्वेतवेदान्त
- Bramhasutrabhasyam chapter  1,2,3,4
- Swami Atmananda- fouryogas, BharatiyavidyaBhavana. Bombay 1966
- Swami Inanananda- Philosophy of yoga, Shri Ramakrishna Ashram, Mysore
- Sing Lalan Prasad.   Tntra, concept publishing Company, Delhi – 1976
- Rajkumaripandey-  Bhartiya yoga pramparakevividhaAyamaRadha Publication, Delhi-1993
- Fenerstein George.  The yoga Tradition: Its History, Literature, philosophy Bhavana Books and prints, Delhi 2002.

## MYS-2: Principal Upanishads & Yoga Vasishtha

### Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

### Unit:-I

Principal Upanishads Brief Introduction of Ten principal Upanishads as the basis of Yogic contest; Ishavasyopanishad: Concept of Karmanishta; Concept of Vidya and Avidya; Knowledge of Brahman; AtmaBhava; KenaUpanishat: Indwelling Power; Indriya and Antahkarana; Self and the Mind; Intutive realization of the truth; Truth transcendental; Moral of YakshaUpakhyana Katha Upanishad: Definition of Yoga; Nature of Soul; Importance of Self Realization; Prashna Upanishad: Concept of Prana and rayi (creation); Panchapranas; The five main questions; Mundaka Upanishad: Two approaches to Brahma Vidya-the Para and Apara; The greatness of Brahmavidya, The worthlessness of Selfish-karma; Tapas and Gurubhakti, The origin of creation, Brahman the target of Meditation

### Unit:-II

Mandukya: Four States of Consciousness and its relation to syllables in Omkara. Aitareya: Concept of Atma, Universe and Brahman.Taittiriya Upanishad Concept of PanchaKosha; Summary of ShikshaValli; AnandaValli; Bhruguvalli.Chandogya Upanishad: Om (udgitha) Meditation; Sandilyavidya, BrihadaryanakaUpanishad : Concept of Atman and Jnana Yoga. Union of Atman and Paramatman

### Unit:-III

Yoga Vasishtha Highlights of Yoga Vashitha, Concept of Adhis and Vyadhis; Psychosomatic Ailments; The four Gatekeepers (Pillars) to Freedom; How Sukha is attained the Highest State of Bliss; Practices to overcome the Impediments of Yoga; Development of Satvaguna; Eight limbs of Meditation; JnanakiSaptabhumika

### Reference Books

- Geeta press Gorakhpur
- Muktikeupaya- Sami NorajanandBhihar
- Yoga BhayasyVachaspati Mishra
- PatanjalyogpradeepOmanandtisth
- Yoga sutra VadhaspatiTika- Hariharnanda
- Patanjali yoga sutra- Dr.KarmbetkarLonavala.
- Yogvighyaanpradeepika-Dr.Vijey pal shashtri ( Styampubilicitionhouse,newdelhi)

# MYS-3: Yoga and Health

## Instructions to Paper Setters (Theory)

The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.

## Unit :-I

Definition & Importance of Health According to WHO; Dimensions of Health: Physical, Mental, Social and Spiritual; Concept of Health and Disease in Indian Systems of Medicine i.e. Ayurveda, Naturopathy, Yogic Concept of Health and Disease: Concept of Adhi and Vyadhi; Meaning and definitions, Concepts of Trigunas, Pancha-mahabhutas, Pancha-prana and their role in Health and Healing; Concept of Pancha-koshas& Shat-chakra and their role in Health and Healing;

## Unit:-II

Role of Yoga in preventive health care – Yoga as a way of life, Heyamdukhamanagatam; Potential causes of Ill-health: Tapatrayas and Kleshas, Physical and Physiological manifestation of Disease: Vyadhi, Alasya, Angamejayatva and Ssvasaprashvasa.Mental and Emotional ill Health: Styana, Samshaya, Pramada, Avirati, Bhrantidarsana, Alabdha-bhumikatva, Anavasthitatva, Duhkha and Daurmanasya •

## Unit:-III

Yogic Diet - General Introduction of Ahara; Concept of Mitahara; Classification in Yogic diet according to traditional Yoga texts;; Diet according to the body constitution ( Prakriti) – Vata, Pitta and Kapha as also Gunas. • Concepts of Diet Pathya and Apathya according to GherandaSamhita,HathaPradeepika and Bhagavad Gita; Importance of Yogic Diet in YogSadhana and its role in healthy living; Diet according to the body constitution ( Prakriti) – Vata, Pitta and Kapha as also Gunas. • Yogic Principles of Healthy Living: Ahara, Vihara, Achara and Vichara; Role of Yogic Positive Attitudes (Maitri, Karuna, Mudita and Upeksha) for Healthy Living, Concept of Bhavas and Bhavanas with its relevance in Health and well-being

## Reference Books-

- Health and yogasana (swami anandana, yogsadnaasrambapunagerjaipur )
- Essence of yoga (swami shivananda)
- Yoga sikhsha (swami satyanandsaraswati)
- Bhagwathgeeta (geeta press Gorakhpur )

- GherandaSamhita (lonavala)
- Hatha Pradeepika(Lonavala)
- A  Glimpse of Human Body – Dr Shirley Telles.
- Human Anatomy & physiology – Dr. Vrinda Singh
- Guyton A.C (1985): Function of Human Body 4th Edition
- Human Physiology – Chattergee C.C (1992)
- Text book of Physiology – Jain A.K.

## MYS-4: DIET AND DIETARY MANAGEMENT FOR COMMON DISEASES

### Instructions to Paper Setters (Theory)

**The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.**

### UNIT I

Definition of the terms: Food, Nutrition, Nutrition and dietetics, Principle of diet therapy, Therapeutic. Nutrition, Planning of Therapeutic diet, Protein, Carbohydrate and Fat: Its functions, sources and effect of deficiency, energy, metabolism, Energy metabolism and water balance.

### UNIT II

Minerals-Functions, effect of deficiency and excess and food sources of calcium, phosphorous, Iron, Iodine, Fluorine and sodium. Vitamin functions, food sources, effect of deficiency and excess of fat soluble vitamin A, D, E, K and water soluble vitamin B1,B2,Niacin,Folic acid and Vitamin C.

### UNIT III

Planning and Dietary Modification of therapeutic diet for fever,thyphoid ,influenza,jaundice,metabolism of diabetes, diabetes diet prescription, diet for obesity and underweight, diet in disease of cardio vascular system, diet in the disease of liver, diet in disease for kidney, diet in peptic ulcer, food allergy and summary of therapeutic diet.

**Reference book:**

- SHILS, M.E, Olson ,J.A, Shike ,M and Ross ,A.C.(1999): Modern Nutrition in Health and Disease 9[th]edition.
- Williams, S.R.(1993):Nutrition andDiet Therapy 7[th]edition.TimesMirror,Mosbycollege,Publishing.
- Mohan,L.K,andEscolt-students (2000)Krauses food Nutrition Diet Therapy.
- Seth ,Y and Singh K.Diet Planning Through Lifestyle in Health and Disease.
- SrilakshmiS.Dietetics 1999.
- Davison,A,Passmore,R.BrockJ.F.andTruewell,A.S.Human Nutrition and Diets

## MYS-5: Sadana and Theory of HathyogaAvam Patanjali Yoga
## Instructions to Paper Setters (Theory)

**The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.**

### Unit-I

Hatha Yoga Pradipika-Hath yoga ki Paribhasha , Abhyaashetuuchitsthaan, Ritukal , SadhanameinSadhakevamBudhaktatva, detail of Yama – Niyama , AsanonkiVidhi ,vahLabh , Pranayama kiparibhasha , PrakarVidhi , benifits& limitations. Shatkarma -Dhoti, Basti, Neti, Nauli, Trataka , kapalabhatikevidhivahLabh , Bandh – Mudra , Mahamudra, Mahabandh, Mahavedh, Khechari, Udiyaana , Jalandhara, Moolbandha , Viparitkarni , Vajaroli, Shaktichalani, Samadhi, Nadanusandhana , KundalinikaSwaroopevam, jagraatkeUpaya.

### Unit- II

Gherandshamhita-SaptaSadhan , Shaktkarma – Dhouti , Basti, Neti, Nauli, Trataka , Kapalbhatikividhi , Sabdhaniyanvahlabh, Asana , Pranayama , Mudrayein , Pratyahara , Dharana,Dhyana& Samadhi kieVivechana, Difference between HathayogaPradipka&GharandShamhita Asana, Pranayama, kriya, adimeinantar.

### Unit III

Yoga its meaning & nature of yoga, concept of chitta,chitta- bhumis,chitta-vrittis,chittavritinirodhaupay, abhyasa and vairagaya as the tools,concept of bhavaprataya&upaypratayaya,chitta-vikshepas (antarayas),ektatvaabhyas,chitta- prasadanam; Types and nature of Samadhi:ritambharapragya and adhyatama- prasada , sampragyat ,asampragyat, sabeeja and nirbeeja Samadhi,

Yogmargkibadhaiye or upaya, abhyasa or vairagye,kriyayog,astangyog, Concept of ishvara, theory of klesha,concept of karmas,nature of dhukha, concept of chaturviyuhavada, Drishyaaurdrashtakaswaroop,sanyogviyogkakaran, dukhkaswaroop,gunnoki char avasthaye,haankaoopaye,pragyakisaptbhumiyaa.

 Introduction to astangayoga ,concept of  yama and niyama, concept of dharna,dhyana and Samadhi. Siddhiyonkestrota or bhed,  Concept of vasana,dharmamegh Samadhi and its result,vivekkhayati,kaivalyakaswaroop.

 **Reference books**
1 Hathayogapradipika –PrakashakKaivalyadhamaLonavlapune
2 GharandSamhita-  PrakashakKaivalyadhamaLonavlapune

3  GharandSamhita – SwaniNiranjananda

4 Hath Yoga Pradipika – Swami MuktiBodhananda

5. txnh'klgk; JhokLor& v}srosnkUr dh rkfrZrHkwfedk

6. C.D. Sharma   -  A  critical Survey of Indian philosophy

7. J.S. Vinayaka  - Indian philosophy

8. H.P. Sinha-  Indian Philosophy

# MYS-6: Psychology and its relevance to yoga

## Instructions to Paper Setters (Theory)

**The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.**

## Unit I

Definition of Psychology , Nature of Psychology scope of Psychology , Branches of Psychology subfields of Psychology , Utility of Psychology relation of Psychology to other fields of study , Psychology of human behaviour Psychology of spiritual growth and yogic management.

## Unit II

Personality Development, its meaning and nature, Characteristic of personality, developmental approach and its assessments personality according to yoga text. Education Psychology , Motivation , Emotion , IQ its meaning, IQ testing and its controversies , Stress , its concepts , causes and Stress according to Yoga and its Challenges to Modern Science.

## Unit III

Psychotherapy, definition, counselling and psychotherapy related fields, guidance clinical psychology, its categories, counsels as hagiology, helping relationship solution to human problems, counselling and guidance expectation, and goals, Approach of counselling and counselling, process of counselling and stages in the counselling process , Special areas in counselling, counselling families, reluctant clients, parents, children, Delinquent marriage, premarital, women, drug addicts, Educational counselling and vocational counselling.

**Reference Books**
1.Yoga Psychotherapy and its application-by Ganesh shanker.
2.Psychotherapy and Counselling  -By a unit of global institute,Kolkata.
3.Counsellingtechniques,interviewing and evaluation method-Do-
4.Yoga Philosophy of Patanjali-AcharyaHariharananda
5.Psychology East & West-Ajay Swami
6.The synthesis of Yoga –Sri Aurobindro
7.SMET –Dr.H.R.Nagendra,Dr.R .Nagarathna.
8.The Yoga Upanisad- Ayanger.T.B.Srinivas.
9.On the meaning of Transpersonel:Some metaphysical perspectives.
    10. Concise Dictionary of Psychology-
    11. Robert   Frager James Fadian – Personality and personnel growth .
    12. C.G Jung - Analytical Psychology: its theory and practice.

# MYS-6: Psychology and its relevance to yoga

## Instructions to Paper Setters (Theory)

**The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.**

## Unit I

Definition of Psychology , Nature of Psychology scope of Psychology , Branches of Psychology subfields of Psychology , Utility of Psychology relation of Psychology to other fields of study , Psychology of human behaviour Psychology of spiritual growth and yogic management.

## Unit II

Personality Development, its meaning and nature, Characteristic of personality, developmental approach and its assessments personality according to yoga text. Education Psychology , Motivation , Emotion , IQ its meaning, IQ testing and its controversies , Stress , its concepts , causes and Stress according to Yoga and its Challenges to Modern Science.

## Unit III

Psychotherapy, definition, counselling and psychotherapy related fields, guidance clinical psychology, its categories, counsels as hagiology, helping relationship solution to human problems, counselling and guidance expectation, and goals, Approach of counselling and counselling, process of counselling and stages in the counselling process , Special areas in counselling, counselling families, reluctant clients, parents, children, Delinquent marriage, premarital, women, drug addicts, Educational counselling and vocational counselling.

**Reference Books**
1.Yoga Psychotherapy and its application-by Ganesh shanker.
2.Psychotherapy and Counselling  -By a unit of global institute,Kolkata.
3.Counsellingtechniques,interviewing and evaluation method-Do-
4.Yoga Philosophy of Patanjali-AcharyaHariharananda
5.Psychology East & West-Ajay Swami
6.The synthesis of Yoga –Sri Aurobindro
7.SMET –Dr.H.R.Nagendra,Dr.R .Nagarathna.
8.The Yoga Upanisad- Ayanger.T.B.Srinivas.
9.On the meaning of Transpersonel:Some metaphysical perspectives.
   10. Concise Dictionary of Psychology-
    11. Robert   Frager James Fadian – Personality and personnel growth .
    12. C.G Jung - Analytical Psychology: its theory and practice.

# MYS-7: Study of Yogic Practices

## Instructions to Paper Setters (Theory)

**The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.**

## Unit-I

Asana- Definition, classification, categories, benefits & limitation. Eight step technique of asana. Technique of asana according to different text.Surya Namaskara-Technique, benefits, limitation and its mudras.Physiological effect of asana and surya-namaskar on human system.

## Unit-II

Pranayama- Definition, classification, types, technique of Pranayama, benefits & limitation. Pranayama method according to different schools. Breathing practices, types, techniques, benefits and limitations. Physiological effect of various Pranayama on human body.Meditation-Definition, types, techniques of meditation.Effect of meditation on various system of human body.

## UNIT- III

Bandha -Definition, Types, techniques, benefits & limitations. Physiological effects of Bandhaon various system of human body. Mudra- Definition, types, techniques, benefits & limitations. Physiological effects of Mudra on various system of Human body.Shat karma- Definition, classification, categories, benefits & limitations. Physiological effect of various  shat karmas on human body.

## Reference books

1. SHILS, M.E, Olson ,J.A, Shike ,M and Ross ,A.C.(1999): Modern Nutrition in Health and Disease 9th edition.
2. Williams,S.R.(1993):Nutrition andDiet Therapy 7th edition.TimesMirror,Mosbycollege,Publishing.
3. Mohan,L.K,andEscolt-students (2000)Krauses food Nutrition Diet Therapy.
4. Seth ,Y and Singh K.Diet Planning Through Lifestyle in Health and Disease.
5. SrilakshmiS.Dietetics 1999.
6. Davison,A,Passmore,R.BrockJ.F.andTruewell,A.S.Human Nutrition and Diets
7. PPH – Dr.H.R. Nagendra, Dr Nagratana
8. Asana kyoAurkaise – OM PrakashTiwari
9. Yogasana – Swami Kavalyanand
10. Text book of yoga – Yogeshwar
11. Asana , Pranamaya, band & Mudra

12. Pranamaya  – Swami SatyanandaSarswati
13. Yoga in Daily  life – Dr Shekar Sharma
14. Light on Yoga- B.K.S Iyengar

# MYS-8: Research Methods and Statistic in Yoga Education

## Instructions to Paper Setters (Theory)

**The paper is divided into three units. The question paper will consist of A, B and C sections. A part will consist of ten compulsory questions (at least three questions from each unit) (2 marks each). B part will consist of nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. C part will consist of six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit.**

## Unit I

Introduction: - Meaning object, Significance, need and important of research and its scope in yoga Education. Types of research, formulation and Development of research problem, methods , central tendency :- objective of Averaging types averages mean and median .
Dispersion:-Measures of dispersion ````

## Unit-II

Correlation and Regression, Meaning and Definition of Correlation.Types of correlation, methods of Determining Correction.Regression Analysis :- meaning and use, regression lines . Regression equations, regressions Coefficient and Calculations, Difference between correlation and Regression.

## Unit-III

Statistical Inference I- Sampling, Advantage of Sampling, types of sampling, sampling distribution, sampling Error, Estimation Hypothesis Testing: - Types I and Type II Error, level of significance. Statistical Inference II- test of Significance small and large sample test and (z, t, f and x²test) Analysis of variance.

## Reference Books

1. Research Methods- H.K. kapil.
2. Research Methodology. C.R. Kotar.
3. Statistical method- S.P. Gupta.
4. Statistical psychology and education – garret.
5. VagyanikMalish.-shrisatpal.
6. Research methods – Dr. H.R. NagendrasharlleyTelles V KY P. Bangalore.

# MYS-I-P Practicals Previous Year

- Paper –I .Asana, Pranayama, Kriya, Bandha Mudra, Relaxation Technique etc.
- (Demonstration + Viva Voce +Teaching Technique)
- Max marks: 100
- 
- Lists of Yoga Practices
- ASANA
- 1.Ardhakati Chakrasana     2.Ardha Chakrasana
- 3.Padahastasana            4.Vajrasana
- 5.Sasankasana              6..Paschimatanasana
- 7.Halasana.                8.Sarvangasana                        .
- 9.Matsyasana.              10.Bhujangasana                    .
- 11.Salabhasana.      12.ArdhaSirsasana                    .
- 13.Sirsasana.              14.Padmasana
- 15.Sukhasana              16.Siddhasana
- 17.Siddha yoni Asana                                        .

- PRANAYAMA              BANDHA                    .
- Sectional Breathing – 4,Bhastrika  JalandharaBandh
- Nadisudhi, Sheetali ,                                MoolaBandh ,uddiyanbandh
- mahabandha, agnisara
- Sithkari , Sadantaujjaiye

- MUDRA
-  Chin Mudra, Chin Maya Mudra, Adhi Mudra , Brahma Mudra, sambhavi Mudra,  kaki Mudra, , shanmukhi Mudra,

- KRIYA
- Kapalabhati , Trataka ( Joyti, Jatru) jalanati, sutra nati ,dhoti (danda ,vastra, vaman)
-         ,
- MEDITATION                Relaxation Technique
-  OM Meditation                        IRT (Instant Relaxation Technique)
-  Cyclic Meditation        DRT (Deep Relaxation Technique)
- Preksha mediation                QRT (Quick Relaxation Technique)
- CHANTING
- Prayer,BhagavatGeeta(Karama yoga ,gyan yoga, raja yoga& Bhakti Yoga) Peace Chant Bhajans&patrotic song etc.

## Reference Books

1. Promotion of Positive health ( Dr. H.R.Nagendra)
2. Pranayama (Kala &Vigyan) ( Dr.H.R.Nagendra)
3. VyasPushpanjali (SVYP) ( Dr. H.R.Nagendra)
4.  SMET (SVYP, Dr. H.R.Nagendra) For the common ailments all the SVYP, Disease Books

# MYS-II-P Practical Final year

SukshamaVyayama, Advance Asana & Management of Yogic Practice for disease & Advance Tech for chronic ailments- PranicEnergisation Technique (PET)


## SUKSHAMA VYAYAMA
1. NETRA - SAKTI - VIKASA (IMPROVING THE EYE SIGHT)
2. KOPALA - SAKTI - VARDHAKA (REJUVENATING THE CHEEKS)
3. KARNA - SAKTI - VARDHAKA (IMPROVING THE POWER OF HEARING)
4. GRIVA - SAKTI - VARDHAKA (STRENGTHENING THE NECK) 1
5. GRIVA - SAKTI - VARDHAKA (STRENGTHENING THE NECK) 2
6. GRIVA - SAKTI - VARDHAKA (STRENGTHENING THE NECK) 3
7. SKANDHA - TATHA - BAHU - MULA - SAKTI - VIKASARA(DEVELOPING THE STRENTH OF THE SHOULDER BLADE AND JOINTS)
8. BHUJA BANDHA-SAKTI-VAKASAKA (STRENGTHENING THE UPPER ARMS)
9. KAPHONI-SAKTI-VIKASAKA (STRENGTHENING THE ELBOW)
10. BHUJA-BALI-SAKTI-VIKRASARA(STRENGHTHENING THE FORE ARMS)
11. MANI-BANDHA-SAKTI -VIKASAKA (DEVELOPING THE WRISTS)
12. KARA-PRASTHA-SAKTI-VIKASAKA (DEVELOPING THE BACK OF THE HAND)
13. KARA-TALA-SAKTI-VIKASAKA (DEVELOPING THE BACK OF THE PALMS)
14. ANGULI-SAKTI-VIKASAKA (STRENGTHENING THE FINGER)
15. KATI - SAKTI - VIKASAKA (STRENGTHENING OF THE BACK) 1
16. KATI - SAKTI - VIKASAKA (STRENGTHENING OF THE BACK) 2
17. JANGHA - SAKTI - VIKASAKA (DEVELOPING THE THIGHS) -I
18. JANGHA - SAKTI - VIKASAKA (DEVELOPING THE THIGHS)-II
19. JANGHA - SAKTI - VIKASAKA (DEVELOPING THE KNEES)-III
20. PINDALI - SAKTI - VIKASAKA (DEVELOPING THE CALVES)
21. GULPHA-PADA-PRASTHA-PADA-TALA-SAKTI-VIKASAKA(DEVELOPING THE STRENGTH OF ANKLES & FEET)
22. PADA-MULA-SAKTI-VIKASAKA (DEVELOPING THE STRENGTHS OF THE SOLE)
23. PAD-ANGULI-SAKTI-VAKASAKA (DEVELOPING THE THOES)

## ADVANCE ASANA
### STANDING POSTURE
1. ARDHAKATI CAKRASANA
2. ARDHA CAKRASANA
3. PADA HASTASANA
4. TRIKONASANA
5. PARIVARTTA TRIKONASANA
6. PARSVA KONASANA
7. ARDHACHAKRASANA
8. GARURASANA
9. GRIVASANA
10. VRIKSANA
11. NATARAJASAN
12. BATYANASANA

### SITTING POSTURE
1. VAJRASANA
2. SASANKASANA SUPTA
3. PASCIMATANASANA
4. SUPTA VAJRASANA
5. USTRASANA
6. VAKRASANA/ARDHA MATYASYENDRASANA

7.YOGA MUDRA                8.PADMASANA/BADDHA PADMASANA
9.PADA PRASAR PASCHIMATTANASANA    10.ARDHA PADMA
PASCHIMATTANASANA
11.JANU SIRASANA              12.EKAPADA PADMATTANASANA
13.UTHITA JANU SIRASANA.       14.EKAPADA PADMATTANASANA
15.MAYURASANA              16.GOMUKHASANA

**PRONE POSTURE**
1.BHUJANGASANA            2.SALABHASANA
3.DHANURASANA            4.MAYURASANA
5.HAMSASANA             6.PADMA MAYURASANA
7.PARIPURNA NAVASANA       8.VRISCHIKASANA

**SUPINE POSTURE**
1.HALASASANA             2.SARVANGASANA
3.MATSYASANA             4.SETUBANDHASANA
5.BADDHA SARVANGASANA    6.EKAPA SETUBHANDHA SARVANGASANA
7.CAKRASANA             8.VIPAREETA KARANI
9.ARDHA PADMASANA       10.KARNA PIDASANA

**TOPSY TURVY POSTURE**
1.ARDHA SIRASASANA       2.SIRSASANA
3.SALAMBHA SIRSASANA     4.NIRLAMBHA SIRSASANA.

**RELAXATION MEDITATIVE**
1.TADASANA.              2.PADMASANA
3.DANDASANA.             4.SUKHASANA
5.MAKRASANA.            6.SIDDHASANA

## MYS:D

Dissertation/project/training/review/ clinical project/internship/case study.Clinical Project Works (minimum 4 cases)/ any experimental studies/topic allotted by the faculty & Presentation

# YOGA

## NEP and Learning Outcome-based Curriculum Framework (LOCF)

### For

### *M.Sc. in Yoga Studies and Therapy Management*

## Faculty of Physical Education

## Department- Center for Entrepreneurship and Skill Development (CESD)

### 2021-23

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# Background

Considering the curricular reforms as instrumental for desired learning outcomes, all the academic departments of Maharaja Ganga Singh University, Bikaner made a rigorous attempt to revise the curriculum of undergraduate and postgraduate programmes in alignment with National Education Policy-2020 and UGC Quality Mandate for Higher Education Institutions-2021. The process of revising the curriculum could be prompted with the adoption of "Comprehensive Roadmap for Implementation of NEP-2020". The Roadmap identified the key features of the Policy and elucidated the Action Plan with well-defined responsibilities and indicative timeline for major academic reforms.

The process of revamping the curriculum started with the series of webinars and discussions conducted by the University to orient the teachers about the key features of the Policy, enabling them to revise the curriculum in sync with the Policy. Proper orientation of the faculty about the vision and provisions of NEP-2020 made it easier for them to appreciate and incorporate the vital aspects of the Policy in the revised curriculum focused on 'creating holistic, thoughtful, creative and well-rounded individuals equipped with the key 21st century skills' for the 'development of an enlightened, socially conscious, knowledgeable, and skilled nation'.

With NEP-2020 in background, the revised curricula articulate the spirit of the policy by emphasizing upon— integrated approach to learning; innovative pedagogies and assessment strategies; multidisciplinary and cross-disciplinary education; creative and critical thinking; ethical and Constitutional values through value-based courses; 21st century capabilities across the range of disciplines through life skills, entrepreneurial and professional skills; community and constructive public engagement; social, moral and environmental awareness; Organic Living and Global Citizenship Education (GCED); holistic, inquiry-based, discovery-based, discussion-based, and analysis-based learning; exposure to Indian knowledge system, cultural traditions and classical literature through relevant courses offering 'Knowledge of India'; fine blend of modern pedagogies with indigenous and traditional ways of learning; flexibility in course choices; student-centric participatory learning; imaginative and flexible curricular structures to enable creative combination of disciplines for study; offering multiple entry and exit points initially in undergraduate programmes; alignment of Vocational courses with the International Standard Classification of Occupations maintained by the International Labour Organization; breaking the silos of disciplines; integration of extra-curricular and curricular aspects; exploring internships

with local industry, businesses, artists and crafts persons; closer collaborations between industry and higher education institutions for technical , vocational and science programmes; and formative assessment tools to be aligned with the learning outcomes, capabilities, and dispositions as specified for each course. In case of UG programmes in Engineering and Vocational Studies, it was decided that the departments shall incorporate pertinent NEP recommendations while complying with AICTE, NBA, NSQF, International Standard Classification of Occupations, Sector Skill Council and other relevant agencies/sources. The University has also developed consensus on adoption of Blended Learning with 10% component of online teaching and 90% face to face classes for each programme.

The revised curricula of various programmes could be devised with concerted efforts of the faculty, Heads of the Departments and Deans of Faculty. The draft prepared by each department was discussed in series of discussion sessions conducted at Department, Faculty and the University level. The leadership of the University has been a driving force behind the entire exercise of developing the uniform template and structure for the revised curriculum. The Vice Chancellor of the University conducted series of meetings with Heads and Deans to deliberate upon the vital parameters of the revised curriculum to formulate a uniform template featuring Background, Programme Outcomes, Programme Specific Outcomes, Postgraduate Attributes, Structure of Masters Course, Learning Outcome Index, Semester-wise Courses and Credit Distribution, Course-level Learning Outcomes, Teaching-Learning Process, Blended Learning, Assessment and Evaluation, Keywords and References. The experts of various Boards of Studies contributed to a large extent in giving the final shape to the revised curriculum of each programme. Stimulated Sessions were conducted under the dynamic leadership or the IQAC, Maharaja Ganga Singh University to give a final shape to the curricula. It is due to their endeavors that the curricula could acquire its present shape.

***To ensure the implementation of curricular reforms envisioned in NEP-2020, the University has decided to implement various provisions in a phased manner. Therefore, the curriculum may be reviewed annually so as to gradually include all relevant provisions of NEP-2020.***

# Programme Outcomes (PO)

**Vision**

To build responsive, responsible, sensitive, creative and thoughtful citizens with a comprehensive understanding of regional, national and international perspectives.

**Mission**

To strive towards the educational, cultural, economic, environmental and social advancement of the region and the nation at large by providing multidisciplinary liberal education involving arts, sciences, social sciences, education, law and commerce & Management and quality programmes which inculcate and enhance students' creative and innovative insights, equipping them with both professional and vocational skills, leading to Bachelors', Masters', Professional, Vocational and Doctorate Programmes.

**About the Programme**

Yoga is an ancient Indian system and is essentially spiritual. It has potential for both prevention of diseases and promotion of health. The holistic approach of Yoga brings harmony in all walks of life and also influences our day-to-day living. It brings suitable changes in the behavioral pattern and attitude thereby helps to improve the inter-personal relationship at home and also in the society. Therapeutic benefits of Yoga have also been revealed by many scientific researches carried out across the globe. Today, Yoga has become popular because of its strengths in prevention and management of many lifestyle related disorders including physiological and psychosomatic disorders.

**Eligibility**

Graduate in any discipline with One year Regular Diploma in Yoga with minimum of 50% marks from Government recognized University/Recognized Institution. Or B.Sc. Naturopathy and Yogic Science/Yogic Science/Yoga/Yoga education with minimum 50% marks from Government recognized University/College or B.Y.N.S Five year regular course with minimum 50% marks from Government recognized University/College.
Note: Selection would be made on the basis of aggregate marks, 25% of graduation and 75% of Yoga Diploma/Certificate Courses.

**Duration of the Course:**

- The duration of course will be two years, which will further divided into four semesters as two semesters in each academic year.

On completing Masters in the Faculty of Physical education, the students shall be able to realize the following outcomes:

| | Programme Outcomes |
|---|---|
| PO1 | **Domain knowledge**: Apply the knowledge of basic sciences that may be relevant and appropriate to physical education and sports sciences leading to solution of complex sports related issues and problems. |
| PO2 | **Problem analysis**: Ability to Identify, defines the actual requirements, formulate, research literature, and analyze complex subject related problems to reaching substantiated conclusions. |
| PO3 | **Design/Development of Solutions:** Ability to design, implement, and evaluate process or program to meet desired needs in the field of physical education and sport sciences. |
| PO4 | **Individual and team work:** Ability to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings to accomplish a common goal. |
| PO5 | **Ethics:** Understanding of professional, ethical, legal, security, social issues and responsibilities in teaching, learning and evaluation. |
| PO6 | **Communication**: Ability to communicate effectively among a range of audiences/ stakeholders |
| PO7 | **Impact**: Ability to analyze the local and global impact of physical activities and sports and games on individuals, organizations and society. |
| PO8 | **Skill development:** Demonstrate skills to conduct research in accordance with the ethical standards of the discipline. Develop effective teaching skills and be able to satisfy the University, College and the School level expectations. |
| PO9 | **Critical thinking**: Demonstrate creative and critical understanding of the subjects of the subject and its philosophy in their varied forms. |
| PO10 | **Identification of Needs**: Ability to identify and analyze user needs and take them into account in the selection, creation, evaluation, and administration of physical education and sport sciences programs. |
| PO11 | **Integration:** Ability to incorporate effectively integrate Science/ Technology/ IT-based solutions to applications |
| PO12 | **Professional Development:** Recognition of the need for and an ability to engage in continuing professional development |

**Programme Specific Objectives:**

I. The programme will provide deeper insight into the curriculum of Yogic Sciences along with the therapeutic applications of Yoga and alternative therapies

II. At the Master level it is also intended that students should get familiar with the original texts of Yoga.

III. It promotes positive health in the students through Yoga and enabling and imparting skills in them to practice and apply Yogic practices for Health to general public and teach Yoga for overall personality development and spiritual evolution.

IV. It invokes and inculcates inquisitive, scientific temper in the students regarding the Traditional Indian Sciences specially Yoga and Spirituality.

V. A research attitude and orientation will also be inculcated into the student so that they further become able to undertake advance and theoretical and applied researches in the field of Yoga and Alternative Therapies.

# Programme Specific Outcomes (PSO)

On completing M.Sc. in Masters in Yoga Studies and Therapy Management, the students shall be able to realise following outcomes:

| **Programme Specific Outcomes (PSOs)** | |
|---|---|
| PSO1 | Students will have knowledge of improving the health of mind and body, Basic knowledge of Yoga on Physical & Mental Level. |
| PSO2 | Students will have knowledge of classical and theoretical foundations of the field of Yoga therapy. |
| PSO3 | Students can conduct yoga class on general level. Eligible for the post of Yoga teacher or Yoga instructor. |
| PSO4 | Spiritually becomes strong and solving problems of stress and strain leading to various diseases. |
| PSO5 | Complete knowledge of Yoga on physical, mental intellectual, emotional & spiritual way. Students will learn Sadhna and yogic concepts in upnishadas. |
| PSO6 | They will be able to get the knowledge about human anatomy & physiology, management for diseases. The programme will help to assess the needs of patients, to design and implement effective patient- or ailment-specific Yoga modules. |
| PSO7 | Students will exhibit all round personality development. Students should be able to work efficiently as a Yoga Teacher in industries, health centres & various institutes. They will be eligible for NET/SET/Ph. D and for the post of Assistant Professor. They can start their Yoga center. |

| | |
|---|---|
| PSO8 | Students will be able to work towards teaching methodology and realization of health for all, as a national goal through Yoga. |
| PSO9 | Students will be able to demonstrate empathy and humane approach towards patients and their families and exhibit inter-personal behavior in accordance with the scientific norms and expectations. |
| PSO10 | Students will be aware and updated with the research advances, various tools, and developments in the field of Yoga. Students will become eligible to do Research on National & International Level. |
| PSO11 | Students will gain better understanding of ethical, social issues and human values. |

## Postgraduate Attributes

- Disciplinary Knowledge

- Creative and Critical Thinking

- Reflective Thinking

- Problem Solving

- Analytical Reasoning

- Communication Skills

- Research Skills

- Life Skills

- Multicultural Competence

- Moral and Ethical Values

- Life-long Learning

- Global Competency

## Structure of Programme

| Course Code | Course Title | Nature | Lecture | Tutorial | Practical | Total Credits | Maximum Marks | | Minimum Passing Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Internal Marks | External Marks | |
| Semester-I | | | | | | | | | |
| Theory Papers | | | | | | | | | |
| FPE YOG 01 CC 01 4011 | Historical Background of Yoga | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FPE YOG 01 CC 02 4011 | Theoretical study of Yogic Practices | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FPE YOG 01 CC 03 4011 | Patanjali Yoga | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |

| Course Code | Title | Type | L | T | P | Credits | Internal | External | Pass Marks |
|---|---|---|---|---|---|---|---|---|---|
| FPE YOG 01 CC 04 4011 | Human Anatomy & Physiology–I | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| | | | | | | | 40 | 160 | |
| | | | | | | | Total Theory Marks | **200** | 72 (36% aggregate) |
| FPE YOG 01 CF 01 4011 | Basics of Yoga | Core Foundation Course | 2 | 2 | 1 | 5 | 36% (Qualifying) | | |

**Practical**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| FPE YOG 01 P 01 4011 | Practical (5 credit) | | | | | | 25 | 75 | 36 (36% aggregate) |
| | **Total Credits** | | | | | **25** | **Grand Total** | **300** | |

**Semester-II**

**Theory Papers**

| Course Code | Title | Type | L | T | P | Credits | Internal | External | Pass Marks |
|---|---|---|---|---|---|---|---|---|---|
| FPE YOG 02 CC 01 4011 | Diet & Dietary Management | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FPE YOG 02 CC 02 4011 | Sadhna & Theory of Hath Yoga | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FPE YOG 02 CC 03 4011 | Yogic Concepts in Upanishads | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FPE YOG 02 CC 04 4011 | Human anatomy & Physiology-II | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| | | | | | | | 40 | 160 | |
| | | | | | | | Total Theory Marks | 200 | 72 (36% aggregate) |
| FPE YOG 02 CF 01 4011 | Human and National Values | Core Foundation Course | 2 | 2 | 1 | 5 | 36% (Qualifying) | | |

**Practical**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| FPE YOG 02 P 01 4011 | Practical (5 credit)) | | | | | | 25 | 75 | 36 (36% aggregate) |
| | **Total Credits** | | | | | **25** | **Grand Total** | **300** | |

**Semester-III**

**Theory Papers**

| Course Code | Title | Type | L | T | P | Credits | Internal | External | Pass Marks |
|---|---|---|---|---|---|---|---|---|---|
| FPE YOG 03 CC 01 4011 | Yogic management for Diseases | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FPE YOG 03 CC 02 4011 | Basics of Naturopathy | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FPE YOG 03 CE 01 4011 OR FPE YOG 03 CE 02 4011 | General Psychology OR Yoga in ancient Text | Core Elective | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FPE YOG 03 EO 01 4011 OR FPE YOG 03 EO 02 4011 | Indian Philosophy Relevant to Yoga OR Ayurveda, Swasthavritta & Diet | Elective Open | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |

| | | | | | | | | 40 | 160 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Total Theory Marks | 200 | 72 (36% aggregate) |

| Practical | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| FPE YOG 03 P 01 4011 | Practical (4 credit) | | | | | | | 25 | 75 | 36 (36% aggregate) |
| | Total Credits | | | | | 20 | | Grand Total | 300 | |

| Semester-IV | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| FPE YOG 04 CC 01 4011 | Research methods and Statistic in Yoga Education | Core Compulsory | 3 | 0 | 2 | 5 | | 10 | 40 | 13 (25 %) |
| FPE YOG 04 D 01 4011 | Dissertation OR Research Project OR Review OR Case Study | Core Elective | 0 | 0 | 10 | 10 | | 25 | 75* | 36 (25 %) |
| FPE YOG 04 EO 01 4011 OR FPE YOG 04 EO 02 4011 | Teaching Methodology of Yoga Practice OR Yoga & Stress Management | Elective Open | 3 | 0 | 2 | 5 | | 10 | 40 | 13 (25 %) |
| *Includes presentation/viva voce each student | | | | | | | | 40 | 160 | |
| | | | | | | | | Total Theory Marks | 200 | 72 (36% aggregate) |

| Practical | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| FPE YOG 04 P 01 4011 | Practical (4 credit) | | | | | | | 25 | 75 | 36 (36% aggregate) |
| | Total Credits | | | | | 20 | | Grand Total | 300 | |

## Learning Outcome Index

### I. Programme Outcomes (PO) and Programme Specific Outcomes (PSO)

| PO | PSO-1 | PSO-2 | PSO-3 | PSO-4 | PSO-5 | PSO-6 | PSO-7 | PSO-8 | PSO-9 | PSO-10 | PSO-11 | PSO-12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PO-1 | X | X | X | X | X | X | X | X | X | X | X | X |
| PO-2 | X | X | X | X | X | X | X | X | X | X | X | X |
| PO-3 | X | X | X | X | X | X | X | X | X | X | X | X |
| PO-4 | X | X | X | X | X | X | X | X | X | X | X | X |
| PO-5 | X | X | X | X | X | X | X | X | X | X | X | X |
| PO-6 | X | X | X | X | X | X | X | X | X | X | X | X |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PO-7 | X | X | X | X | X | X | X | X | X | X | X | X |
| PO-8 | X | X | X | X | X | X | X | X | X | X | X | X |
| PO-9 | X | X | X | X | X | X | X | X | X | X | X | X |
| PO-10 | X | X | X | X | X | X | X | X | X | X | X | X |
| PO-11 | X | X | X | X | X | X | X | X | X | X | X | X |
| PO-12 | X | X | X | X | X | X | X | X | X | X | X | X |

## II. Programme Specific Outcomes (PSO) and Core Courses (CC):

| PSO | CC-1 | CC-2 | CC-3 | CC-4 | CC-5 | CC-6 | CC-7 | CC-8 | CC-9 | CC-10 | CC-11 | CC-12 | CC-13 | CC-14 | CC-15 | CC-16 | CC-17 | CC-18 | CC-19 | CC-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSO-1 | | X | X | X | | X | X | X | X | X | | X | X | X | X | X | X | X | X | X |
| PSO-2 | | X | X | | X | X | X | X | | X | X | X | X | X | | X | X | X | X | X |
| PSO-3 | X | | X | X | | X | X | X | X | | X | X | X | X | X | X | X | X | X | X |
| PSO-4 | | | | X | X | X | X | | X | X | | X | | | X | | X | X | | X |
| PSO-5 | | X | | X | X | | X | | X | | X | | X | | | X | X | | | |
| PSO-6 | | X | X | | X | | | | X | X | X | | X | X | | X | | X | | X |
| PSO-7 | X | X | X | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | X |
| PSO-8 | | | X | X | X | X | | | X | X | X | | X | X | X | X | | | | |
| PSO-9 | X | X | | | | | X | X | | X | X | X | X | | X | X | | | | X |
| PSO-10 | | | | | X | X | | | | | X | X | | X | X | X | X | | | X |
| PSO-11 | | | | | X | | | | | X | | X | | | | X | X | | X | |

## III. Programme Specific Outcomes (PSO) and Elective Courses (EC):

| PSO | EC-1 | EC-2 | EC-3 | EC-4 | EC-5 | EC-6 | EC-7 | EC-8 | EC-9 |
|---|---|---|---|---|---|---|---|---|---|
| PSO-1 | X | | X | X | | | X | X | X |
| PSO-2 | X | X | | | | X | X | X | |
| PSO-3 | | X | | | X | X | | X | X |
| PSO-4 | | X | X | X | | | X | | |
| PSO-5 | | X | X | X | | X | | | X |
| PSO-6 | X | | X | X | | X | X | | X |
| PSO-7 | X | X | X | X | X | X | X | X | X |
| PSO-8 | | | | X | X | | X | X | X |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PSO-9 | X | | | X | X | | X | X | |
| PSO-10 | X | X | | X | | X | X | X | |
| PSO-11 | | X | | | | X | | | |

# SEMESTER –I

## Historical Background of Yoga

**Course Objective:** To provide learning about the history of Yoga, classical Yoga texts, Yogic gurus, and contributions of Yoga to religions

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. To learn about Origin and History of Yoga.
2. To have an idea about Evolution of Yoga.
3. To learn Yogic Traditions and Yoga Gurus etc
4. Explain the various definitions of Yoga, history of Yoga and branches of Yoga

### Unit-I
Historical and mythological aspects leading to the origin of Yoga, history and development of Yoga, Definition of Yoga in different Yoga text (Patanjali Yog Sutra, Upanishad, Bhagwad Geeta, Hath Yoga) and different schools of thought.

### Unit-II
Yoga in Veda- A brief introduction of Jnana Yoga, Bhakti Yoga, Karma Yoga, Dhyana Yoga, Yama- Niyama and Prana sadhna in Veda. Yoga in Upanishad- Bhakti Yoga, Karma Yoga, Astanga Yoga, Sadanga Yoga, Nada Yoga, Mantra Yog, Dhyana Yoga. Nature and types of Yoga in Yoga Vasistha.

### Unit-III
Eminent Indian Yogis and Yoga- Life sketch and their contribution to Yoga:, Yoganand Paramhans, Maharshi Raman, Shree Arvind, B. K. S. Iyengar, T. Krashnamacharya, Maharshi Mahesh Yogi, Swami Dhirendra Brahamchari ji, Swami Rama .

**Suggested reading:**

1. Vishwanath Mukharjee-Bharat Ke Mahan Yogi, Vishwavidyalaya Prakashan, New Delhi, 2005
2. Vishwanath Mukharjee - Bharat ki mahaan Saadhikayen, Vishwavidyalaya Prakashan, New Delhi, 2005.
3. Kalyan(Bhakt Ank) - Gita press Gorakhpur.
4. Kalyan(Sant Ank)- Gita press Gorakhpur.
5. Swami Atmananda- four yogas, Bharatiya vidya Bhavana. Bombay 1966

6. Swami Inanananda- Philosophy of yoga, Shri Ramakrishna Ashram, Mysore
7. Sing Lalan Prasad.  Tantra, concept publishing Company, Delhi – 1976
8. Rajkumari pandey-  Bhartiya yoga prampara ke vividha Ayama Radha Publication, Delhi- 1993
9. Fenerstein George.  The yoga Tradition: Its History, Literature, philosophy Bhavana Books and prints, Delhi 2002. 6. T.R  Srinivasa ayyangar amarta-Nadopanishad
10. All literature published by Shree Arvind Ashram pondychery
11. All literature published by Bihar School of Yoga
12. Kalyan (Yogank) - Gita press Gorakhpur, 2002.
13. Kalyan (Yoga Tatwank)- Gita press Gorakhpur, 1991.

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**Paper code-FPE YOG 01 CC 02 4011**

**Theoretical Study of Yogic Practices**

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**Course Objective:** To demonstrate various forms of breathing exercises, called pranayama breathing, discover various yoga postures, called asanas, and integrate mantras (yoga chanting) into their yoga practice.

**Course Level Learning Outcomes:**

After the completion of the course, the student shall be able to:

1. Explain the various definitions of Asana, history of Asana and Types of Asana.
2. Describe category of Yogasanas, its importance, methods, rules, regulations and limitations.
3. Illustrate the various limbs of Ashtanga Yoga.
4. Demonstrate knowledge of pranayamas, and breathing and lifespan.
5. Demonstrate various types of Yogasanas in their correct method of performance.
6. Demonstrate different pranayamas.

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**Unit-I**

**Asana**

</div>

Definition, classification, categories, benefits & limitations, eight step technique of asana, techniques of asana according to different text, Surya namaskara technique, benefits, limitations and its mudras, physiological effect of asana and surya-namaskar on human system.

<div align="center">

**Unit-II**

</div>

**Pranayama**

Definition, classification, types, technique of pranayama, benefits & limitations of Pranayama . and physiological effect of Pranayama on human body.

**Breathing practices**

Definition, classification, types, techniques, benefits and limitations of Breathing practices. physiological effects of Breathing practices on human body.

**Meditation**

Definition, types, techniques of meditation, effect of meditation. Effect of mediation on various system of human body.

## Unit-III

Definition, types, techniques, benefits and limitations, Physiological effects of Bandha on various system of human body, Mudra- Definition, types, techniques, benefits & limitations, Physiological effects of Mudra on various system of Human body.

**Shat Karma**

Definition, classification, categories, benefits and limitations, Physiological effect of various shat karmas on human body.

**Suggested readings:**
1. PPH - Dr. H.R. Nagendra, Dr Nagratana
2. Asana kyo aur kaise – OM Prakash Tiwari
3. Yogasana – Swami Kuvalyanand
4. Text book of yoga – Yogeshwar
5. Asana , Pranamaya, band & Mudra
6. Pranamaya  - Swami Satyananda Sarswati
7. Yoga in Daily  life - Dr Shekar Sharma
8. Light on Yoga- B.K.S Iyengar
9. Gherand Samhita- Bihar School of Yoga
10. Hatha Yoga Pradipika- kaivlyadhama, lonevala

## Paper code-FPE YOG 01 CC 03 4011

### Patanjali Yoga

**Course Objective:** To illustrate the knowledge of traditional texts.

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. Get the knowledge of traditional Mind (Chitt )
2. To understand how can  Control the mind
3. Explain about obstacles of yog sadhana & solution.
4. Technique of self realization  & knowledge of different types of samadhi

## Unit-I

**Samadhi Paada**

Yoga, meaning & nature of yoga; Concept of Chitta, Chitta-Bhumis, Chitta-Vrittis, Chitta-Vrittinirodhopaya,  Abhyasa and Vairagya as tools,  Concept of Bhavapratyaya & Upaypratayaya,  Sadhan Panchak, Chitta-Vikshepas (Antaraya), Ektattva Abhyasa, Chitta-prasadanam, Types and nature of Samadhi:  Adhyatmaprasada and Ritambharaprajna, Samprajnata, Asamprajnata, Sabeeja & Nirbeeja Samadhi, Difference between Samapattis and Samadhi;  Concept of Ishwara and attributes of Ishwara, Process of Ishwarapranidhana.

**Sadhana Paada**

Concept of Kriya Yoga, theory of Kleshas; Concept of Karmashaya and Karmvipaka, Nature of dhukha, Concept of Chaturvyuhavada, Drishyanirupanam, Drasthanirupanam, Prakriti-Purusha Samyoga; Brief Introduction to Ashtanga Yoga; (Yama- Niyama; Concept of Vitarka & Mahavrata; Asana, Pranayama, Pratyahara and their siddhis.)

**Unit III**

**Vibhuti Paada and Kaivalya Paada**

Introduction of Dharana, Dhyana and Samadhi, Nature of Sanyama, Concept of Chitta Samskara, Parinamatraya and Vibhutis. Five means of Siddhis, concept of Nirman Chitta, Importance of Siddhis achieved through Samadhi, Four types of Karmas; Concept of Vasana; Dharmamegh Samadhi and its result, Viveka Khyati Nirupanam, Kaivalya Nirvachana.

**Suggested reading:**

1. Mukti ke upaya- swawi Nirjanananda, Bihar School of yoga.
2. Yoga bhashya- Vachaspati Mishra.
3. Patanjal Yog Pradeep-OMananda fifth.
4. Yoga Sucha- Yachaspah Tika – Haniharnanda.

5. Patanjali Yoga sucha-Dr kanmbelkan- lonavale.
6. Patanjali Yog darshan-Geeta press Ghorakhpur

**Paper code-FPE YOG 01 CC 04 4011**

**Human Anatomy & Physiology -I**

**Course Objective:** To give a basic understanding of the human anatomy and human physiology. And to give a deeper understanding of the human systems to explain underlying mechanism of changes in body due to Yoga practices.

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. The student can understand the knowledge of human anatomy & physiology of Cell structure.
2. Various systems in the body like Skeletal system, Muscular system, Digestive system, Circulatory system, Respiratory system, Excretory system, Endocrine system, Nervous system and Reproduction.

**Unit-I**

**Muscular system**
Types of muscles, Theory of contraction and relaxation, categories of muscles, properties and functions of muscles.
**Skeletal system**

Introduction of skeletal system, function of skeletal system,  types of joints, composition of bone, types of bones, vertebral column of  human body.

## Unit-II

### Respiratory system

Definition of respiration, structure and  function, mechanism of respiration, exchange of  gases, oxygen transportation, and co-transportation in respiration.

### Digestive system

Definition of digestion, structure and function, mechanism of absorption of various product of digestive system,   control of digestion in various part of alimentary, hormonal control of digestive system.

## Unit-III

### Circulatory system

Structure and function of heart and blood vessels,  cardiac cycle, regulation of cardiac output, blood pressure and factor affecting it, hypertension, composition of blood, blood cells, function of blood, composition of lymph and functions.

### Suggested reading:

1. A glimpse of Human body-  Dr. sharley Telles
2. Human anatomy – Physiology -   Dr. Vrinda singh
3. Function of Human body-  4<sup>th</sup> edition-  Guyton A.c. (1985)
4. Human Physiology – chatterge c.c. (1992)
5.  5. Tent book of Physiology -  Jain A.K

## Paper code-FPE YOG 01 CF 01 4011

### Basics of Yoga (Core Foundation Course)

**Course Objective:** To learn Traditional Indian Yoga systems from root leval and to understand the philosophy of the Yoga ~~systems~~

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. Gain the basic understanding of fundamental and applied scientific concepts and methods of Yogic Science

## Unit-I

Yoga and its meaning, Principles of Yoga (Triguna, Antahkarana-chatustaya, Panchakosha).Introduction to major schools of Yoga (Jnana, Bhakti, Karma, Patanjali yoga, Hatha yoga). Shatkarma introduction-  Neti, Trataka, Kapalbhati.

## Unit-II

Introduction of Patanjali  ashtanga Yoga in a short  ( yama, niyama, asana, pranayama, pratyahara, dharna, dhyana, Samadhi )Introduction and study of Bhagavad Gita- including

memorization of selected Slokas (Chapter II -47, 48, 49, 50 and 70). Concepts and principles of Aahara (Diet) in Hathapradipika and Bhagawadgita (Mitahara and Yuktahara).

## Unit-III

Eminent Indian Yogis and Yoga- Life sketch and their contribution to Yoga: Ram Krishna Paramhans, Swami Vivekananda, Swami Dayanand Saraswati, Pandit Shreeram Sharma, Swami Kuvalyanand ji, Swami Shivanand Saraswati, Swami Satyanand Saraswati.

**Suggested reading:**

1 Goyandka, Harikrishandass : Yoga Darshan Geeta Press, Gorakhpur (Samvat 2061).
2 Swami Vivekananda : Jnana Yoga, Bhakti Yoga, Karma Yoga, Raja Yoga (4separate books) Advaita Ashrama, Kolkata, 2011 & 2012
3 Sahay G. S. : Hathayogapradipika MDNIY, New Delhi, 2013
4 Gita press Gorakhpur : Shreemad Bhagvadgita Gita press Gorakhpur, Samvat 2073
5 Kotecha, Vaidya Rajesh : A Beginner's Guide to Ayurveda Chakrapani Publications, Jaipur 2016
6 Quality Council of India (QCI) : Yoga professionals Official Guidebook for Level 1 Excel Books, New Delhi 2016
7 Brahmachari Swami Dhirendra : Yogic Suksma Vyayama, Dhirendra Yoga Publications, New Delhi, 1986
8 Sahay G. S. : Hathayogapradipika MDNIY, New Delhi, 2013
9 Kalayan : Upanishads (23rd year Special) Geeta Press, Gorakhpur
10 Gore M. M. : Anatomy and Physiology of Yogic Practices, Kanchana Prakashana, Lonavala, 2004
11 Swami Karmananda : Management of Common Diseases, Bihar Yoga Publication Trust, 2006, Munger
12 Basavaraddi, I. V. & others : Yoga Teachers Manual for School Teachers, MDNIY, New Delhi, 2010

## Paper code-FPE YOG 01 P 01 4011

### PRACTICAL

**Lists of Yoga Practices**

**Suryanamaskara**
Traditional 10 Steps, 12 Steps

**Asana**

| | |
|---|---|
| 1. Ardhakati Chakrasana | 2. Ardha Chakrasana |
| 3. Padahastasana | 4. Vajrasana |
| 5. Shashankasana | 6. Paschimotanasana |
| 7. Halasana. | 8. Sarvangasana |
| 9. Matsyasana. | 10. Bhujangasana |

| | |
|---|---|
| 11. Salabhasana. | 12. Ardha Sirsasana |
| 13. Sirsasana. | 14. Padmasana |
| 15. Sukhasana | 16. Siddhasana |
| 17. Siddha yoni Asana | |

| **Pranayama** | **Bandha** |
|---|---|
| 1. Sectional Breathing | 1. Jalandhara Bandh, |
| 2. Breathing Practices | 2. Uddiyan Bandha |
| 3.Nadi sudhi | 3. Moola Bandh |
| 4. Bhramari | |
| 5.Bhastrika | |

**Mudra**
1.Chin Mudra, 2.Chinmaya Mudra, 3.Aadi Mudra, 4.Brahma Mudra

**Kriya**

| | |
|---|---|
| 1. Kapalabhati | 2.Trataka |

**Relaxation**
1.IRT (Instant Relaxation Technique)
2.QRT (Quick Relaxation Technique)
3.DRT (Deep Relaxation Technique)

**Yog Nindra**

**Chanting**
Prayer, Bhagvad Geeta (Karma yoga & Bhakti Yoga), Peace chanting and bhajans, etc.

# Semester-II

## Paper code- FPE YOG 02 CC 01 4011

## Diet & Dietary management

**Course Objective:** To promote the active use of yogic concept of food and nutrition and to gain the knowledge of food and metabolism.

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. Describe fundamentals of nutrition, with respect to different nutrients and food groups
2. Illustrate details of nutritional requirements for different age groups
3. Classify modern nutrition to traditional Naturopathic diets;
4. Illustrate the use of specific herbs in common diseases, with therapeutic values.
5. Analyze the nutritional status of a patient; Plan, implement and evaluate nutritional advice for people of different ages and patients of different diseases.

## Unit-I

Definition of the terms: food, nutrition, nutrition and dietetics, principle of diet therapy, therapeutic nutrition, planning of therapeutic diet, protein, carbohydrate and fat: Its functions, sources and effect of deficiency, energy, metabolism, energy metabolism and water balance.

## Unit-II

Minerals-functions, effect of deficiency and excess, food sources of calcium, phosphorous, iron, iodine, fluorine and sodium,  vitamin functions, food sources, effect of deficiency and excess of fat soluble vitamin  A , D, E, K and water soluble vitamin B1, B2, Niacin, Folic acid and Vitamin C.

## Unit-III

Planning and dietary modification of therapeutic diet, therapeutic for fever, thyroid, influenza, jaundice, metabolism of diabetes, diabetes diet prescription, therapeutic diet for obesity and underweight, therapeutic diet in disease of cardio vascular system, therapeutic diet in the disease of liver,  therapeutic diet in disease for kidney,  diet in peptic ulcer,  food allergy and summary of therapeutic diet.

### Suggested reading:

1. SHILS, M.E, Olson, J.A, Shike, M and Ross, A.C. (1999): Modern Nutrition in Health and Disease 9$^{th}$  edition.
2. Williams,S.R. (1993): Nutrition and Diet Therapy 7$^{th}$ edition.Times Mirror,Mosby college,Publishing.
3. Mohan, L. K, and Escolt-students (2000): Krauses food Nutrition Diet Therapy.
4. Seth, Y and Singh K. Diet Planning Through Lifestyle in Health and Disease.
5. Srilakshmi S.Dietetics 1999.
6. Davison, A, Passmore, R. Brock J. F. and Truewell, A. S. Human Nutrition and Diets

## Paper code- FPE YOG 02 CC 02 4011

### Sadhna & Theory of Hath Yoga

**Course Objective:** To give an introduction of Hatha yoga and to give an understanding of the prerequisites of Hatha Yoga.

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. Learn methods of performing asanas, pranayama, mudras and bandhas  in traditional way. To understand the principles of Hatha Pradipika, Gheranda samhita Sapta Sadhan, and learn method of cleansing technique of body ( Shaktkarma )

### Unit-I

Hatha Yoga Pradipika
Hath Yoga ki Paribhasha, Abhyaas hetu  uchit  sthaan, Ritu kal, Sadhana mein Sadhak avum Badhak tatva,  detail of Yama-Niyama, Asano ki Vidhi, Vah Labh, Pranayama  ki paribhasha, Prakar  Vidhi , benifits and limitations.

## Unit-II

Hatha Yoga Pradipika
Shatkarma -Dhoti, Basti, Neti, Trataka, Nauli, kapalabhati ke vidhi vah Labh, Bandh v Mudra- Mahamudra, Mahabandh, Mahavedh, Khechari, Udiyaana, Jalandhara, Moolbandha, Viparitkarni , Vajaroli, Shaktichalani,
Samadhi
Nadanusandhana, Kundalini ka Swaroop evam, jagraat ke Upaya.

## Unit-III

Gheranda samhita
Sapta Sadhan
Shaktkarma – Dhouti, Basti, Neti, Nauli, Trataka, Kapalbhati ki vidhi , Savdhaniyan labh, Asana , Pranayama, Mudrayein, Pratyahara, Dharana,Dhyana & Samadhi kie Vivechana, Difference between Hathayoga Pradipka & Gharand Shamhita- Asana, Pranayama, kriya, adi mein antar.

**Suggested reading:**

1. Hathayogapradipika –Prakashak Kaivalyadhama Lonavla pune
2. Gharand Samhita - Prakashak Kaivalyadhama Lonavla pune
3. Gharand Samhita – Swani Niranjananda
4. Hath Yoga Pradipika – Swami Mukti Bodhananda

## Paper code- FPE YOG 02 CC 03 4011

### Yogic Concepts in Upanishad

**Course Objective:** To provide the knowledge of upanishads and yogic knowledge in Upanishad.

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. To teach the essence of the principal Upanishads.
2. Practice Yoga according to the principles Upanishads.
3. Holistic living according to the precepts of Upanishads.

## Unit-I

**General Introduction of Upanishads**

**Ishavasyopanishad:** Concept of Karmanishta; Concept of Vidya and Avidya; Knowledge of Brahman; Atma Bhava.

**KenaUpanishad:** Self and the Mind; Intuitive realization of the truth; Moral of Yaksha Upakhyana.

**KathaUpanishad:** Definition of Yoga; Nature of Soul; Importance of Self Realization.

## Unit-II

**General Introduction of Upanishads.**

**Prashna Upanishad:** Concept of Prana and rayi (creation); Panchapranas; The six main questions;

**Mundaka Upanishad:** Two approaches to Brahma- Vidya- Para and Apara; The greatness of Brahmavidya; Worthlessness of Selfish-karma; Tapas and Gurubhakti; The origin of creation, the ultimate aim of Meditation- Brahmanubhuti.

**Mandukya Upanishad:** Four States of Consciousness and their relation to syllables in Omkara.

**Unit-III**

**General Introduction of  Upanishads.**

**Aitareya Upanishad:** Concept of Atma, Universe and Brahman.

**Taittiriya  Upanishad:** Concept of Pancha Kosha; Summary of Shiksha Valli, AnandaValli, Bhriguvalli.

**Chhandogya Upanishad:** Om (udgitha) Meditation; Shandilyavidya.

**Brihadaranyaka  Upanishad:** Concept of Atman and Jnana Yoga; Union of Atman and Paramatman

**Suggested reading:**

1. Upanishad sangraha- Jagdish Shashtri,Motilal banarashidas, Varanasi,Delhi,Chennai.
2. Swami Shivananda- The essence of Principle Upanishad, Divine Life Society,1980 Swami Nikhilananda-
3. 108 Upanishad- The Principle Upanishad, Courier Crporation, 2003
4. 108 Upanishad- Sadhana khand- Pt. Shri ram Sharma  Acharya, Shantikunj, Haridwar
5. 108 Upanishad- Brahmavidya khand - Pt. Shri ram Sharma  Acharya, Shantikunj, Haridwar
6. 108 Upanishad- Jnana Khand - Pt. Shri ram Sharma  Acharya, Shantikunj, Haridwar
7. Upnishad bhasye- Shankara Acharya, Geeta press, Ghorakhapur


**Paper code- FPE YOG 02 CC 04 4011**

**Human anatomy & Physiology-II**

**Course Objective:** To provide an understanding and basic principles of Anatomy, and Physiology.

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. To learn the background knowledge of basic concepts of anatomy and physiology.
2. To enrich the various concepts of respiratory, digestive, endocrine systems, etc.
3. To learn the involvement of special senses.

## Unit-I

**Nervous System**

Definitions, role of nervous system, structure of neuron,Type of neuron, morphological and function, conduction of nervous system (brain & spinal cord) peripheral nervous system, autonomic nervous system.

**Immune System**

Definition, Types of Immunity (Innate, direct, indirect, acquired, direct, indirect, hormonal and cell mediate), antigens, antigen antibody reaction.

## Unit-II

**Endocrine System**

Endocrine gland - structure, function, secretion, regulation of hormonal secretion, mechanism of action of hormone, emphasis on physiology of diabetes and stress hormones, physiological functions and abnormalities in secretion of pituitary, thyroid, parathyroid, hormones, adrenal and reproductive hormones, disorders of endocrine glands.

**Reproductive System**

Definition, types of reproductive, male reproductive system, female reproductive system, menstrual cycle, pregnancy changes during pregnancy.

## Unit-III

**Excretory System**

Definition, anatomy & physiology of kidneys, structure and function of nephron, mechanism of urine formation, regulation of urine formation

**Sense Organs**

Structure and functions (eye, skin, ear, nose and tongue), physiology of different sense organs.

**Suggested readings:**

1. A Glimpse of Human Body- Dr Shirley Telles.
2. Human Anatomy & physiology - Dr. Vrinda Singh
3. Guyton A.C (1985): Function of Human Body 4th Edition
4. Human Physiology - Chattergee C.C (1992)
5. Text book of Physiology - Jain A.K.

**Human and National Values (Core Foundation Course)**

**FPE YOG 02 P 01 4011**

# Practical

**Suryanamaskara Vinyasa Series-A and B**

**ASANA**

| | |
|---|---|
| 1.**Tadasana** | 2.Uthita Padahastasana |
| 3.Trikonasana | 4.Parivartta Trikonasana |
| 5.Supta Vajrasana | 6.Ustrasana |
| 7.Vakrasana/ Ardha Matyendrasana | 8.Setu bandhasana |
| 9.Ekapada Setu bandha Sarvangasana | 10.Chakrasana |
| 11.Dhanurasana | 12.Mayurasana |
| 13.Salambha Srisasana | |

**PRANAYAMA**

| | |
|---|---|
| 1.Sheetali | 2.Shitkari |
| 3.Sadanta | 4.Ujjaiyi |

**BANDH**

| | |
|---|---|
| 1.Jalandhar Bandha | 2. Uddiyana Bandha |
| 3. Mool Bandha | 4. Mahabandha |

**MUDRA**

1.Shambhavi  Mudra

2.Shanmukhi Mudra

3. Vipritkarni Mudra

| **KRIYAS** | **MEDIATION** |
|---|---|
| Neti – Jala neti ,Sutra neti | Preksha Meditation , OM Meditation |
| Dhouti– Danda, Vastra, Vamana | |

**CHANTING**

Prayer, Bhagavad Geeta (**Jnana yoga , Raj yoga**) peace chant, Bhajans etc.

# Semester-III

## Yogic Management for Diseases

**Course Objective:** To provide an understanding about concept of disease according to yoga & its yogic management.

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. Describe the physiological effects of various yogic practices and to understand the therapeutic aspects of Yoga as applied to different disease conditions.
2. Analyze knowledge of Yoga therapy in managing various diseases.
3. Demonstrate usage of therapeutic aspect of Yoga in promotive, preventive, curative and rehabilitative therapy.
4. Correlate the evolution and composition of the human body according to different schools of medicine such as Naturopathy, Yoga, Ayurveda, Homeopathy, Modern Medicine, etc.

### Unit- I

Yogic Management for-

Respiratory system- Nasal Allergy and Asthma, Cardiovascular system- Hypertension and coronary artery diseases, Digestive system- hyperacidity, Irritable bowel syndrome constipation, Gas (Flatulence).

### Unit-II

Yogic Management for-

Reproductive system-   Infertility, Menstrual disorder, Role of stress in problems of Pregnancy, Nervous system-Epilepsy, migraine, Endocrine System- Diabetes, obesity, Thyroid (Hypo & Hyper)

### Unit-III

Yogic Management for-

Musculo skeletal system - Arthritis, Back pain, Ankylosing spondylitis, Psychiatry Anxiety, depressive neurosis, Insomnia, phobia, OCD (Obsessive Compulsive disorder) schizophrenia, Special senses -  eyes (Error of Refraction).

**Suggested reading:**

1. Yoga for common ailments   series published by  SVYP-( S-VYASA )
2. Light on pranayama  B.K.S. Iyenger,
3. Yoga therapy- by swami kuvalayanand, Lonavala
4. Bandh & madras swami  geetananda ,
5. Asana, Pranayama,Bandh & Mudras swami  Swami Satyanand Saraswati,Bihar School of Yoga
6. Yoga for different ailments Robin monro, Nagarathna & Nagendra.

7. PPH- SVYP   Bangalore

**Basics of Naturopathy**

**Course Objective:** To provide an understanding and basic principles of of Naturopathy including major contributors to the field and their work

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. Classify and Correlate Ten basic principles of Naturopathy
2. Analyze Principles behind using the diagnostic procedures of Naturopathy, like spinal diagnosis, facial diagnosis, iris diagnosis, and chromo diagnosis.
3. Describe the various principles of Naturopathy with respect to the body, health, disease and therapy, diagnosis and management
4. To provide knowledge of naturopathy tools

**Unit-I**

Definition and principles of Naturopathy, Historical development of Naturopathy, Introduction of Indian Naturopathy, Life Sketch and contribution of Eminent Naturopaths- Mahatma Gandhi (Father of Indian Naturopathy), Vitthal Das Modi, Dr. Lindlhar.

**Unit- II**

Introduction of all naturopathy tools, alternative system of therapy- introduction, meaning and various methods, therapy by Panch Tatva Sadhana (Aakash,Vayu, Agani, Jal, Prathvi), methods of naturopathy, fasting therapy limitations, method and benefits, deep breathing, breathing practices, morning walk etc.

**Unit III**

Sun Rays Therapy: limitations, methods and benefits, Chromo therapy- limitations, methods and benefits. Massage therapy- limitations, methods and benefits, hydro therapy- limitations, methods and benefits, mud therapy-limitations, methods and benefits, naturopathy diets.

**Suggested reading:**

1. K.S. Joshi, Speaking of Yoga & Nature- Cure Therapy, Sterling Publishers Private Limited (1991)
2. M.M.Bhamgara: The Human Body: Nature's Amazing Creation, Bipin Parekh, Mumbai (2004)
3. Parakrutik Ayuivijnana- Dr. Jindal- Republication of Kalyana Anka Arogya Seva Prakasham, Modinagar.
4. History and Philosophy of Nature Cure by S.J. Singh
5. Prachina Vangamaya Me Prakrutika Chikitsa-Swami Ananta Bharati, CCRYN, New Delhi.
6. Prakratik chikitsa kai siddant,Dr.Jindal
7. Philosophy of nature curse- Henary lidahinn
8. Practice of Nature curse – Henary lindlahan

9.  Practice Nature curse – Dr. k. Laxman sharma
10. History and philosophy of- S. T. Singh.
11. My Nature curse- M. K. Gandhi
12. nature curse treatonents- I. N. Y. S. publication Bangalore
13. Massage thearaphy – Dr J. H. kelloy.
14. Rational hydrotherapy – Dr. J.H. kelloy.
15. Essentials of food and Nutritin – Swannition.
16. Baths- S. J. singh.
17. K.S. Joshi-Speaking of Yoga and Naturopathy, Orient Paperback, New Delhi, 1990.
18. H.K. Bhakru, The complete Hand book of Nature Cure, Jaico Publishing House
19. Dr. Henry Lindlhai-The practice of Nature Cure, CCRYN, New Delhi, 2012.
20. Dr. Rakesh Jindal- Prakritik Ayurvigyan, Arogya seva prakashan, Modinagar, U.P.
21. Dr. Rudolf - Diet and Nutrition, Himalayan Institute Press.

## FPE YOG 03 CE 01 4011
## General Psychology

**Course Objective:** To describe the evolution of Psychology from speculation to science.
**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1.  Illustrate mechanisms of sense and perception, states of consciousness and their functions.
2.  Understand basic and complex functions such as learning, memory, thinking, language, motivation, emotion, intelligence, development of psychology across lifespan, personality, stress coping, social psychology, attitudes, etc.
3.  Explain abnormal psychology and describe etiology and psychopathology along with classification of disorders.
4.  Demonstrate knowledge of therapies aimed at psychological health, such as psychotherapy, Yoga, etc.

### Unit-I

### Introduction to Mental Health

Causes and Consequences of Mental Conflicts and frustration: Introduction to Common mental disorders: Insomnia, Depression, Stress, Anxiety disorders

### Mind and Consciousness

Mind – its meaning , definition and functions ,stages of mind- unconscious , sub-conscious, conscious and super-conscious, mind – body relation

### Introduction to Altered States of Consciousness

Sleep: Stages of Sleep, Sleep Disorders;

### Unit-II

**Personality:** Nature and Types of Personality; Determinants of Personality: Heredity and Environment Facts and Stages of Personality Development;

**Cognitive Psychology**: Sensation, Perception, Attention, Memory, Learning :- Their definitions and types,

**Behavioural Psychology**: Psychology as a Science of Behaviour; Psychological basis of behavior.

## Unit-III

**Counseling:-** Counseling definition, its aims and objectives, its categories, helping relationship, solution to human problems,counseling and guidance, expectation, and goals, Counseling techniques, Interviewing & Methods, Preparation of counseling, pre-Counseling, interview, case History, Reason for Making Appointment counseling relationship, counseling context process, Steps of counseling Process, counselor variables, counselee's skills, counseling interview, counselee Counselor relationship, interview technique, approaches to evaluation usefulness of Counseling.

**Suggested Readings:**

1. Arun kumar singh evm Aasish kumar singh- Modern General psychology in hindi, Motilal banarsidass publication, 2015
2. Amarnath Rai v Madhu Asthana-Guidence and counseling(concepts, areas and approaches) in hindi, Motilal banarsidass publication, 2017
3. K.N. Udupa- Stress and its management by yoga, Motilal banarsidass publication, 1998.
4. Arun Kumar Singh-Uchchatar Asamanya Manovigyan, Motilal Banarsi Das Delhi, 2007
5. Dr. Arun K. Sao & Dr. Akhileshwar Sao - Tanav Avm Yoga, Radha Pub. New Delhi, 2013.
6. Suresh Barnwal-Mansik Swasthya Avm Yoga, New Bhartiya Book Corporation, New Delhi, 2002.
7. R.S. Bhogal -Yoga & Mental Health & Beyond, Kaivalyadham S.M.Y.S. samiti, Lonavala, 2015.
8. Ganesh Shankar-Psychotherapy & Yoga Traditions, Satyam publication, New Delhi.
9. Yoga Psychotherapy and its application-by Ganesh shanker.
10. Psychotherapy and Counselling -By a unit of global institute,Kolkata.
11. Counselling techniques,interviewing and evaluation method-Do-
12. Yoga Philosophy of Patanjali-Acharya Hariharananda
13. Psychology East & West-Ajay Swami
14. The synthesis of Yoga –Sri Aurobindro
15. SMET –Dr.H.R.Nagendra,Dr.R .Nagarathna.
16. The Yoga Upanisad- Ayanger.T.B.Srinivas.
17. On the meaning of Transpersonel:Some metaphysical perspectives.
18. Stephen Palmer-Introduction to Counselling and Psychotherapy: The Essential Guide, Sage Publication, Inc, California, 2005.
19. Shanti Prakash Atrey- Yoga Manovigyan, International standard publication, ND
20. Sriram Sharma Acharya- Chetan, Super Chetan avm Achetan Man, Akhand Jyoti Mathura, 1998.
21. Sriram Sharma Acharya- Chikitsa Upchar ke Vividh Ayam, Akhand Jyoti Mathura, 1998.
22. Sriram Sharma - Vyaktitva Vikas hetu Uchchastariya Sadhanayein, Akhand Jyoti Mathura 1998.
23. Sriram Sharma - Aparimit Sambhavanao ka Agar Manviy Mashtishk, Akhand Jyoti Mathura 1998

**Course Objective:** To provide the knowledge of hatha yoga philosophy.

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. To provide philosophical theory of Hatha yoga tradition.
2. To provide understanding of hatha yoga concept & its science.

**Unit-I**

**Shiv Samhita-**
**Tritiya V chaturth Patal ke sabhi Sutra.**

**Unit-II**

Shiv Samhita
**Pancham Patal ke sabhi Sutra**
**Siddha Siddhanta Paddhati**
Pratham Updesh- parbrahama ki aadim panch shaktiya evm unke gun, mahasakarapinda ki aath murti, prakriti pinda ki uttapatti, antakarana panchaka, kulpanchaka, vyaktishaktipanchak, das nadiyo ke dash dwar, dash vyau, sthul sharir ka uttpattikram,

**Unit-III**

Siddha Siddhanta Paddhati
Dwitiya Updesh (Pind ka Vichar)- navchakranirupana, shodash aadhar, lakshyatrya,vyompanchak, astanga yoga,

Tratiya upadesha-ikkish brahamanda, chosatha varna, saath dwip,saath samudra,aatha kulparvata, sattaish nakshtra, swarg,naraka,bandhana,mukti

Chaturth Updesh-Pindadhar –dwividha kundalini
Pancham updesh-Yogi ki veshbhusha, yog marg ka vaisisthya, param-pad prapti kai kuch uppaya,yog ki panch avastha, yogi ka kartavye, sadguru kai lakshana, guru sabda ki vyatpatti,

Shashtam Updesh- Avadhut Yogi ke Lakshan, mahavritta, siddha yogi ki visestaye,
**Suggested reading:**

1. Shiva Samhita-  Pandit.Hari Prasad Tripathy Chokhambha Krishna Das Academy Varanasi
2. Shiva Samhita-  Mahesh Chand Ji Kavalla Dham Lopnavala
3. Shiva Samhita – Paramhansh Swami  Ananth Bharti , Swami Vishav Swaroop
4. Siddhasiddhantapaddhatih-  Dwarka Das Shastri
**5.** Siddhasiddhantapaddhatih  Dr. M.L Gharote , Dr. G.K  Pai

**Course Objective:** To learn about knowledge of nature and characteristics, development of Indian philosophy and to learn about knowledge of Vedic thoughts.

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. Learn about the concept of Yoga psychology, Self and Consciousness in the direction of Indian Psychology.
2. Learn about the general concept of advaita philosophy
3. Learn about the general concept of Samkhya philosophy
4. Learn about the general concept of Bhagwad geeta philosophy

### Unit- I

General introduction of Sankhya Philosophy, theory of causation, forms of Satkaryavada, Prakrti and it Gunas, evolution and arguments for its existence, characteristic of Prakrti, objection against Prakrti, Purusa, and its gunas, arguments for its existence, Plurality of Purusa, relationship between Prakriti and Purusa, theory of bondage and liberation, types of liberation, practices of Yoga.

### Unit- II

Brief introduction of Bhagwatgeeta, Arjun vishad yog, sat v asat la laksahna, Swadharma, Geeta ke anusar atma ka swaroop, Shitha- Pragya, karma sidhant, Type of karma, Dhyana yoga, Bhakti kai prakar (nirgun v sagun bhakti),v Bhakat kai prakar, Brahmagyan ka upaya (ghyan),Abhyaas aur Bairagya, deviye sampada v aasuri sampada.

### Unit- III

General introduction of Advaita Vedanta, Conception of absolute [Brahman], Conception of soul &individual soul, the nature of soul and individual soul, Three states of Jiva, the relations between jiva and Brahman, three bodies of the jiva, Theory of world- Three grades of existence, [Satya], Theory of Maya, functions of Maya, characteristics of Maya, theory of causations-vivartvada, conception of the God, the proof of existence of the God, Theory of Bondage and liberation, concept, meaning, types of karma, knowledge and action [karma] , Knowledge and liberation.

**Suggested reading:**

1  जगदीष सहाय श्रीवास्वत अद्वेत वेदान्त की तार्तित भूमिका
2  C.D. Sharma  -  A  critical Survey of Indian philosophy
3  J.S. Vinayaka  - Indian philosophy
4  H.P. Sinha -  Indian Philosophy
5  डॉ. डी.एन. सिंह  अद्वेत और विषिष्टाद्वेत वेदान्त
6  Bramhasutrabhasyam     chapter  1,2,3,4
7  Shri Madnjagwat Geeta Bhashya – Acharya Sankar
8  Shri Madnjagwat Geeta- Ramsukh das maharaj
9  Sankhaya Tatva kaumudi – vachaspati Mishra
10 Sankhyakarika  - Ishwor Krishna Virchit. 5. H.P. Sinha-  Outlie of Indian Philosophy

11  N.K. Devraj – Indian Philosophy
12  C.D. Sharma – A crtical survey of Indian Philosophy.

## FPE YOG 03 EO 02 4011
## Scheme of examination

**Course Objective:** To learn about the fundamentals of Ayurveda, Yoga, Panchakarma, Shatkarma, Ahara and Sdvritta.

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. Understand the philosophy, principles, and concepts of Ayurveda
2. Get the knowledge about Sdvritta, Achara & diet according to different text
3. Learn the various treatment modalities of diseases through Ayurveda and Yoga

### Unit-I

**Fundamentals of Ayurveda and Yoga**
Yoga Health – General introduction to ayurveda and its relationship with yoga, concept of health and disease in ayurveda , yoga and naturopathy, concept, role and importance of prakriti, deha prakriti, manasa prakriti, concept, role and importance of – swasthavritta, concept, role and importance of dincharya, ratricharya and ritucharya,

### Unit-II

**Panchakarma & Shatkarma**
Concept of Pancha Karma in Ayurveda & Shatkarma in Yoga, Concept of Snehan & Swedan, Concept of Vaman, Virechan & Basti.

### Unit-III

**Sadvritta, Achara**
Concept of Sadvritta , Achara in Ayurveda & Yogic Lifestyle, Types of Sadvritta & their importance in life, Achara-rasayan.
**Concept of diet in Ayurveda and Yoga**
According to Bhagwad Geeta, According to Hatha Yoga,
**Concept of Mitahara-(Pathya & Apathya)**
According to Hatha Pardipaka
According to Gheranda Samhita
**Concept and Type of Ahara according to Ayurveda**
Satvik Ahara,Rajsik Ahara,Tamsik Ahara

**Suggested reading:**

1. Singh Ramharsh, Swasthvritta Vijnana, Choukhambha Sanskrit Ptatisthana, Delhi.
2. Kaushik, Mai Ram, Ayurveda Kya Hai?, Bikaner: Anand Prakashan, 2003.
3. Dash, V.B., Ayurvedic Treatment For Common Diseases , Delhi Diary, 1974.
4. Ayurveda darshan- Acharya Balkrishan,Divya prakashan ,Patanjali yogpeeth,Haridwar

**ASANA**

| | |
|---|---|
| 1.Parsva Konasana | 2.Parvatasana |
| 3.Garudasanaa | 4.Yoga Mudra |
| 5.Janu Sirasan | 6.Gomukhasana |
| 7.Padmasana | 8.Hamsasana |
| 9.Navasana | 10.Karnapidasana |
| 11.Viparita Karni | 12.Garvasana |

**PRANAYAMA**

| | |
|---|---|
| 1.Chandra Bhedana | 2.Surya Bhedana |
| 3.Chandra Anulom- Viloma | 4..Surya Anulom –Viloma |

**MUDRA**

| | |
|---|---|
| 1.Manduki Mudra | 2.Ashwini Mudra |
| 3.Vajroli or Sahajoli Mudra | |

**KRIYA**

Nauli- Madhayama

Vaam

Dakshini

Nauli Chalan ( Clockwise& Anticlockwise )

Basti

Sankh prakhalana ( Laghu &Purna)

**MEDITATION**

Cycle Mediation,

# Semester-IV

**FPE YOG 04 CC 01 4011**
**Research methods and statistic in Yoga education**

**Course Objective:** To gain an overall understanding of nature and scope of research in yoga.

 **Course Level Learning Outcomes:**

After the completion of the course, the student shall be able to:

1. Contribute the value of qualitative and quantitative research approach
2. Have an idea about methods of data collection, data analysis and publication
3. Enable students to choose the most appropriate research method / design to address a particular research question.
4. Enable the students to learn the basic concepts of statistics.
5. Understand the nature and scope of research in yoga, various research methods and design, and areas of research Gain practical competency in statistical concepts related to experimental research

6. Search literature for their research work. The students will be able to apply technologies in organizing different types of data, present results effectively by making appropriate displays, summaries, and tables of data, perform simple statistical analyses.

### Unit- I

**Introduction: - Meaning object**, significance, need and important of research and its scope in yoga education, types of research, formulation and development of research problem, methods, central tendency - objective of averaging, types averages - mean, mode and median. Dispersion- measures of dispersion standard deviation and coefficient of variations.

### Unit-II

Correlation and regression, meaning and definition of correlation, types of correlation, methods of determining correction, regression analysis - meaning and use, regression lines, regression equations, regressions coefficient and calculations, difference between correlation and regression.

### Unit-III

Statistical Inference- sampling, advantages of sampling, types of sampling, sampling distribution, sampling error, estimation hypothesis testing - types I and type II Error, level of significance, statistical inference II- test of significance small and large sample test and (z, t, f and $x^2$ test), analysis of variance.

**Reference Books**
1. सांख्यिकी के मूल तत्व - कैलाश नाथ नागर
2. Research Methods- H.K. kapil.
3. Research Methodology. C.R. Kotar.
4. Statistical method- S.P. Gupta.
5. Statistical psychology and education – garret.
6. Vagyanik Malish.- shri satpal.
7. Research methods – Dr. H.R. Nagendra sharlley Telles V KY P. Bangalore.

## FPE YOG 04 D 01 4011

## Dissertation/ Research Project / Review /Case Study

**Course Objective:** The students will learn the methods of research problem analysis and preparation of content for report/dissertation writing and putting them into presentation.

**Course Level Learning Outcomes:**
After the completion of the course, the student shall be able to:
1. Learn to prepare varieties of diagrams and charts with interwoven pictures, photographs and flow charts. Give presentation in various conferences, meetings, and deliver lectures.
2. Learn to execute research project by planning, collecting data, calculating the data and finally preparing a dissertation.

The student shall prepare a report of his/her research work carried out by him/her and shall present it to the external examiner. The examiner will evaluate the work carried out and shall award the marks accordingly. The student will select a topic of Dissertation/case study etc. in consultation with his/her supervisor/guide/mentor on any topic related to yoga.

## FPE YOG 04 EO 01 4011
## Teaching Methodology of Yoga Practice

**Course Objective:** The purpose of this course is to communicate knowledge of teaching methods and techniques in Yoga.

**Course Level Learning Outcomes**:
After the completion of the course, the student shall be able to:
1. Describe the principles and importance of teaching methods in yoga.
2. Describe Types of Teaching Methods, experimental & observation methods, and concept of counseling in Yogic sciences.

### Unit-I

**Introduction to Teaching Methods**
Concept of eight step method of teaching ~~methods~~, principles and importance of teaching methods, teaching methods in yoga.

### Unit-II

**Teaching Techniques**
Teaching technology, modern teaching aids: lecture, demonstration, audio visual presentation, smart-classroom management and lesson planning on various topic (disease, Promotion of positive health, Sports etc.)

### Unit-III

**Types of Teaching Methods and Counseling in Yoga**
Lecture methods, demonstration methods, experimental & observation method, concept of counseling & yoga, aims & principals of counseling, importance of counseling in yoga,

**Suggested reading:**
1. S.K. Kochar, Methods and techniques of teaching, Sterling publications Pvt. Ltd, New Delhi
2. Sharma M.K., Educational Technology and Management, H.P.Bhargav Book House, Agra (2011).
3. Gharote M.L., & Ganguli S.K., Teachning Methods for Yogic Practices, Kaivalyadhama, Lonavala (1988)
4. Swami Satyananda, Early Teaching of Bihar School of Yoga, Munger, Bihar.

## FPE YOG 04 EO 02 4011
## Yoga and Stress Management

**Course Objective: T**o communicate the knowledge and concept of stress and its management through Yoga.

**Course Level Learning Outcomes**:
After the completion of the course, the student shall be able to:
1. Understand the importance of yoga in the stress management.
2. Describe the management of stress through asana, pranayama and meditation and relaxation techniques etc.
3. Illustrate the role of stress in disease and its effect of stress on health & society

## Unit-I

Concept of stress, signs, symptoms &causes of stress,physiology of stress,types of stress. stress in modern culture & society, psychological symptoms of stress, yogic concept of stress according yoga vashishatha,bhagwad geeta& patanjali yoga darshana.

## Unit-II

Effect of stress on health, effect of stress on psychological health, effect of stress on physiological health, effect on personality & effect on society.

## Unit-III

Competency of yoga techniques to manage stress, management of stress through yama & niyama, management of stress through asana, pranayama & meditation, management of stress , through yoga nindra and relaxation techniques, management of stress, through IAYT.

**Suggested reading:**

1. Stress and its Management through Yoga       -Uduppa, K.N.
2. Spiritualize to lead a Stress Free Life      - Krishna Murthy, V.S.
3. Yoga and Yogic Therapy                       - Ram Harsh Singh
4. Yoga Therapy                                 - Swami Kuvalyananda
5. Yogic Management of Psychiatric Disorders    -Basvareddy I.V.

### FPE YOG 04 EO 01 4011

### Practical

Advance spiritual relaxation techniques

1. MSRT (Mind Sound Resonance Technique )
2. PET (Pranic Energisation Technique )

Chanting Vyas Pushpanjali – SVYASA
1. Mahamritunjaya mantra
2. Nirvanashatkarma

Lesson plan presentation topic given by faculty

**SUKSHAMA VYAYAMA**
1. NETRA - SAKTI - VIKASA (IMPROVING THE EYE SIGHT)
2. KOPALA - SAKTI - VARDHAKA (REJUVENATING THE CHEEKS)
3. KARNA - SAKTI - VARDHAKA (IMPROVING THE POWER OF HEARING)
4. GRIVA - SAKTI - VARDHAKA (STRENGTHENING THE NECK) 1
5. GRIVA - SAKTI - VARDHAKA (STRENGTHENING THE NECK) 2
6. GRIVA - SAKTI - VARDHAKA (STRENGTHENING THE NECK) 3
7. SKANDHA - TATHA - BAHU - MULA - SAKTI - VIKASARA(DEVELOPING THE STRENTH OF THE SHOULDER BLADE AND JOINTS)
8. BHUJA BANDHA-SAKTI-VAKASAKA (STRENGTHENING THE UPPER ARMS)
9. KAPHONI-SAKTI-VIKASAKA (STRENGTHENING THE ELBOW)
10. BHUJA-BALI-SAKTI-VIKRASARA(STRENGHTHENING THE FORE ARMS)
11. MANI-BANDHA-SAKTI -VIKASAKA (DEVELOPING THE WRISTS)
12. KARA-PRASTHA-SAKTI-VIKASAKA (DEVELOPING THE BACK OF THE HAND)
13. KARA-TALA-SAKTI-VIKASAKA (DEVELOPING THE BACK OF THE PALMS)
14. ANGULI-SAKTI-VIKASAKA (STRENGTHENING THE FINGER)
15. KATI - SAKTI - VIKASAKA (STRENGTHENING OF THE BACK) 1

16. KATI - SAKTI - VIKASAKA (STRENGTHENING OF THE BACK) 2
17. JANGHA - SAKTI - VIKASAKA (DEVELOPING THE THIGHS) -I
18. JANGHA - SAKTI - VIKASAKA (DEVELOPING THE THIGHS)-II
19. JANGHA - SAKTI - VIKASAKA (DEVELOPING THE KNEES)-III
20. PINDALI - SAKTI - VIKASAKA (DEVELOPING THE CALVES)
21. GULPHA-PADA-PRASTHA-PADA-TALA-SAKTI-VIKASAKA(DEVELOPING THE STRENGTH OF ANKLES & FEET)
22. PADA-MULA-SAKTI-VIKASAKA (DEVELOPING THE STRENGTHS OF THE SOLE)
23. PAD-ANGULI-SAKTI-VAKASAKA (DEVELOPING THE THOES)

## Teaching Learning Process

- Lectures

- Discussions

- Simulations

- Role Playing

- Participative Learning

- Interactive Sessions

- Seminars

- Research-based Learning/Dissertation or Project Work

- Technology-embedded Learning

# Blended Learning

Blended Learning is a pedagogical approach that combines face-to-face classroom methods with computer-mediated activities in the process of teaching and learning. It has been decided that blended learning be taken recourse to only if such need arises (unfortunately). To face such a situation, the teacher be kept in a ready to use mode. Hence, only 10% teaching be done through blended learning after deliberations of the departmental level.

# Assessment and Evaluation

- Continuous Comprehensive Evaluation at regular after achievement of each Course-level learning outcome
- Formative Assessment on the basis of activities of a learner throughout the programme instead of one-time assessment
- Oral Examinations to test presentation and communication skills
- Open Book Examination for better understanding and application of the knowledge acquired
- Group Examinations on Problem solving exercises
- Seminar Presentations
- Review of Literature
- Collaborative Assignments

## Scheme of Examination

The **Masters in Yoga Studies and Therapy Management** (MSc) is of two years (4 semesters) duration full time programme. The programme will have core courses, core elective, core fundamental, and elective open papers, a dissertation/project/training/review/clinical project/internship/case study in the 4th semester and combined practical paper based on theory papers in each semester. The dissertation/project/training/review/clinical project/internship/case study will be evaluated by an external examiner. An educational tour may be organized for students within or outside the State under the supervision of faculty members.

1. English/Hindi shall be the medium of instructions and examination.
2. There will be yearend examination. The yearend examinations, evaluation, publication of results, award of marks statements and award of diploma shall be undertaken by MGS University, Bikaner.
3. The system of evaluation shall be as follows:
3.1 The evaluation scheme shall comprise external evaluation and internal evaluation. Each theory paper will carry 50marks (80% marks external + 20% marks internal). Practical paper will carry 100 marks (75% marks external + 25% marks internal). Any student who fails to participate in classes, viva-voce, practical work will be debarred from appearing in the end semester examination
3.2 The duration of written examination for each paper shall be of three hours and Practical examination shall be for one day duration.
3.3 The minimum attendance required by a candidate will be as per the University rules.
4. With regards to the Dissertation/project/training/review/clinical project/internship/case study, the scheme of evaluation shall be as follows:
4.1 The candidate has to submit report/thesis/dissertation/case study in a spiral/bound form in three copies which would be evaluated by an external examiner. Total marks for Project/case studies/training/dissertation/internship shall be 100 (75% marks external + 25% marks internal).
5. Regular students shall be permitted to appear/reappear/improve in course as per Maharaja Ganga Singh University rules.

6. Pass percentage, award of degree, scope for improvement – as per Maharaja Ganga Singh University rules and regulations (CBCS).
   **Pass Criteria**
7. Each theory paper shall be of 50 marks (40 external +10 Internal). For passing in the each theory examination, a candidate is required to obtain 25% marks in individual paper and 36% marks in aggregate of all theory papers and 36% marks separately in the practical examination and dissertation.

## CLASSIFICATION OF SUCCESSFUL STUDENTS

| Division | Total Marks |
|---|---|
| First Division | 60% and above |
| Second Division | Above 48 % and below 60 % |
| Pass | Above 36 % and below 48 % |
| Fail | Below 36 % |
| Backlog | As per University Norms |

**Affiliation: The Programme shall be governed by the CESD, Yoga, Maharaja Ganga Singh University, Bikaner, Rajasthan**

## Evaluation

| **Internal Assessment** (Theory): | Midterm Examination | 7.5% |
|---|---|---|
| | Term Paper | 7.5% |
| | Students Participation | 5.0% |

| **Internal Assessment** (Practical & Dissertation**):** | 25% |
|---|---|

| **External Assessment** (Theory): | 80% |
|---|---|

| **External Assessment** (Practical & Dissertation): | 75% |
|---|---|

## Examination Paper Pattern

**The question paper will consist of A, B and C sections.**
- A section will have ten compulsory questions (at least three questions from each unit) (2 marks each). Each question shall carry equal marks.
- B section will have nine questions (three questions from each unit) and students are required to attempt five questions (5 marks each) selecting at least 1 question from each unit. Each question shall carry equal marks.
- C section will have six questions (2 questions from each unit of syllabus) and students are required to attempt three questions (10 marks each) selecting 1 question from each unit. Each question shall carry equal marks.

  Questions of section I, II and III are to be answered in 50, 250 and 500 words respectively. The duration of each course examination shall be 3 hours. On the basis of the marks obtained the student shall be awarded SGPA and CGPA on the basis of the formula specified in the CBCS rules.

# Keywords

- ❖ LOCF

- ❖ NEP-2020

- ❖ Blended Learning

- ❖ Face to face (F to F) Learning

- ❖ Programme Outcomes

- ❖ Programme Specific Outcomes

- ❖ Course-level Learning Outcomes

- ❖ Postgraduate Attributes

- ❖ Learning Outcome Index

- ❖ Formative Assessment and Evaluation

- ❖ Comprehensive and Continuous Evaluation

# References

❖ **National Education Policy-2020.**

https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

❖ **The draft subject specific LOCF templates available on UGC website.**

https://www.ugc.ac.in/ugc_notices.aspx?id=MjY5OQ==

❖ **Draft Blended Mode of Teaching and Learning: Concept Note available on UGC website.**

https://www.ugc.ac.in/pdfnews/6100340_Concept-Note-Blended-Mode-of-Teaching-and-Learning.pdf

# M. G. S. UNIVERISTY, BIKANER

# SYLLABUS

# SCHEME OF EXAMINATION AND
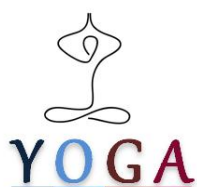
# COURSES OF STUDY

## BSC YOGA 2021-22



# Maharaja Ganga Singh University

# Bikaner

# Maharaja Ganga Singh University

## C.E.S.D | Center for Entrepreneurship & Skill Development

# YOGA

**Center for Entrepreneurship and Skill Development (CESD)**
**Programme Structure and Codification of Papers**

| Three Years | B.Sc (Yogic Science) | Min. Passing Marks 48 (T) and 24 (P) | Max Passing Marks 135 |
|---|---|---|---|
| I Year | BYS-1<br>BYS-2<br>BYS -3<br>BYS-I -P | 16<br>16<br>16<br>24 | 45<br>45<br>45<br>65 |
| II Year | BYS-4<br>BYS-5<br>BYS-6<br>BYS-II -P | 16<br>16<br>16<br>24 | 45<br>45<br>45<br>65 |
| III Year | BYS-7<br>BYS-8<br>BYS -9<br>BYS-III -P | 16<br>16<br>16<br>24 | 45<br>45<br>45<br>65 |
| | **Total of Marks** | | **600** |

**Scheme of Examinations**

1. English/Hindi shall be the medium of instructions and examination.
2. There will be yearend examination. The yearend examinations, evaluation, publication of results, award of marks statements and award of degree shall be undertaken by MGS University, Bikaner.
3. The system of evaluation shall be as follows:
3.1 Each theory paper will carry 45marks. Practical paper will carry 65 marks. Any student who fails to participate in classes, viva-voce, practical work will be debarred from appearing in the yearend examination
3.2 The duration of written examination for each paper shall be of three hours and Practical examination shall be for one day duration.
3.3 The minimum attendance required by a candidate will be as per the University rules.
4. Regular students shall be permitted to appear/reappear/improve in course as per Maharaja Ganga Singh University rules.
5. A candidate who fails in one paper except compulsory papers at the examination shall be given chance to clear the same and in that condition he/she will be considered eligible for the next higher class. If he/she fails in more than one paper, he/she will be declared as fail. If candidate who passes in practical(s) shall be exempted from reappearing in the same and marks obtained by him/her in practical(s) shall be carried forward. Pass percentage, award of Degree, Scope of improvement as per Maharaja Ganga Singh University rules or regulation for B.Sc. examination.

**Affiliation: The Programme shall be governed by the CESD, Yoga, Maharaja Ganga Singh University, Bikaner, Rajasthan**

**B.Sc (Yogic Science)**

Introduction: The aim and the Objective of the Centre is to impart the Knowledge of Yoga to the Younger Generation and the Public, for general awareness about the usefulness of Yoga in the Field of Research and Upanishad and Vedanta to make Yoga a way of life. Yoga is one such Ancient solution to modern problems. It has received great impetus during the last half century and has now spread all over the world. This had resulted in increasing the popularity of Yoga all around, but it had also led at the same time to many innovations, some desirable, but most of them undesirable. Hence, there is a need to Present Yoga in its traditional form for the benefit of the discerning Public. Yoga is not only for the use of the Student Community but also for the public at large. So, all the below mention Courses are very much in need to introduce in the University to promote Yoga.
*The students have got good opportunity in Hospitals, Schools & Colleges, Hotel industry, Resort, Self Centre for yoga therapy, Tourism field etc.

**Eligibility:** 10+2 from any recognized Board.
Admission: Admission shall be on the basis of Merit.
Venue: Course will be conducted at CESD, Yoga, MGSU, Bikaner.
Total seats: 40

Duration:  3Years

# B.Sc (Yogic Science)

| Compulsory Subjects: | Max Marks | Min. Pass Marks |
|---|---|---|
| 1. General Hindi 3hrs. | 100 | 36 |
| 2. General English 3hrs. | 100 | 36 |
| 3. Elementary Computer 2hrs. | 100 | 36 |
| 4. Environmental Studies 2hrs. | 100 | 36 |

**Note: 1. The marks secured in Compulsory papers shall not be counted in awarding the division to a candidate.**
**2. Non appearing or absent in the examination of compulsory paper will be counted a chance.**

## B.Sc PART-I

**Scheme**
**Three papers**           **Min. Pass Marks: 48**      **Max Marks: 135**

| | | | |
|---|---|---|---|
| **BYS-1** | **3 Hrs Duration** | **Min. Pass Marks: 16** | **45 Marks** |
| **BYS-2** | **3 Hrs Duration** | **Min. Pass Marks: 16** | **45 Marks** |
| **BYS-3** | **3 Hrs Duration** | **Min. Pass Marks: 16** | **45 Marks** |
| **BYS-I-P** | **5 Hrs** | **Min Pass Marks: 24** | **Max Marks: 65** |

## BYS-I: BASIC PRINCIPLE OF YOGA AND ITS RELEVANCE

**Pattern of Paper Each paper is divided into 3 sections:**
Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)
Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)
Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

### Unit-I
Yoga -need of the hour, concept of Yoga, Definition of Yoga, Basics of Yoga, The Four main stream of Yoga, Gyana, Bhakti Raja and Karma Yoga, brief glimpse into each of these streams.

### Unit-II
Stress & yoga, yoga for emotion culture, the science of happiness. Yoga in education, Yoga & personality

## Unit-III
Concept of Health, Health as general understood, defined by WHO, positive Health, Dimenstion of health

## Unit-IV
Heath and disease, illness according to yoga, Ayurveda,Ritucharya,Dincharya and Tridosha.

## Unit-V
Defination of Naturopahty,  Illness according to Naturopathy , basic principles  and tools of naturopathy.

## BYS-2: HUMAN BIOLOGY and NUTRITION  RELATED BIOCHEMISTRY

**Pattern of Paper Each paper is divided into 3 sections:**
Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)
Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)
Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

## Unit -I
Introduction  of  cell, tissue, organ system Nervous system, Endocrine system., Musculo-skeletal system, Blood and lymph system, Digestive system

## Unit -II
Cardio-Vascular system, Respiratory system. Immune system. Excretory system, Reproductive system, special senses.

## Unit -III
**Introduction to Nutrition**: Food as a source of nutrients, function of food definition of nutrition, nutrient, adequate, optimum and good nutrition, Interrelationship between nutrition and health-visible symptoms of good health.Concept of balanced diet. Functional Food Groups: Basic four, Basic five, Basic seven.

## Unit- IV
Carbohydrates: Composition, classification,  food  sources,  functions,  storage  in       body, recommended  allowances  and  effects  of  deficiency  and  excess.   Lipids:  Composition classification, food sources, functions role of essential fatty acids, recommended allowances and effects of deficiency and excess. Lipids: composition classification, food sources,fuctions role of essential  fatty  acids,recommended  allowances  and  effects  of  deficiency  and  excess. Proteins: Composition, structure and classification, denaturation of    proteins, Importance of essential and

non essential amino acidsElementary Knowledge of quality of portions, supplementary value of portions, foods sources recommended allowances and effects of deficiency. **Energy:** Units of measuring energy, fuel value of food, calculation of energy. Value of diets. Factors contributing to total energy expenditure, BMR and factors affecting it, physical activity, SDA of food. Recommended allowances, effects of deficiency and excess.

## Unit-V

**Enzymes:** Definition chemical nature, classification, co-enzymes & co-factors, deficiency and role. **Minerals :** Role in nutrition, sources, bioavailability, recommended allowances and effects of deficiency of Calcium, Iron, Iodine, Sodium, Potassium and Zinc. **Vitamins :** Definition, Classification, units of measurement functions, sources, factors affecting absorption & utilization, Recommended allowances and deficiency of (a) fat soluble vitamins A, D, E and K, (b) Water soluble Vitamins : Thiamine, Riboflavin, Niacin, folic acid, Pyridoxine and ascorbic acid. **Water:** As a nutrient, function, sources, requirement water balance, effect of deficiency.

## BYS-3: INDIAN EPICS

**Pattern of Paper Each paper is divided into 3 sections:**
Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)
Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)
Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

## Unit – I

Provides students with basic elementary and practical knowledge of sanskra, alphabet and phonetics. Grammar and syntax, formation and understanding of simple sentences. Common Samskrta terms used in Literature, relationship with other language.

## Unit –II

Historical aspects, life sketch of Narada the author. The science of emotions culture as portrayed in NBS. Smritis( Introduction of Manu and yagyavalkya smriti) and **the** Historical scenario of Bhagavad –Gita.

## Unit –III

The key conflict of duty Vs Ethics of Arjuna. Conflict resolution, Technology - Jnana Dhyana (one pointedness of mind, bliss in Yoga, control of mind perfection in Yoga.)

## Unit –IV

Bhakti and Karma Yoga stream.(A Glimpse into eighteen chapters of Gita)(II & III chapters)

## Unit-V

Impotant shlokas-45,4.36,4.34,2.20,6.25,6.14,6.34.6.35,6.32,6.21,6.28,8.10,6.28,
6.45,5.21,7.16,16.13,16.4,16.5,10.40,10.41,12.8,11.3,11.8,11.9,11.7,11.45,11.52,18.54,18.66,8.5,1
8.16,12.7,3.1,3.4,3.6,3.7,18.25,18.24,8.23,2.47,4.16,4.17,2.48,2.50,4.18,4.20,3.19,2.51,2.70,6.4,6.6
,6.11,4.31,6.17,6.12,6.13,6.25,6.14,6.34,6.35,6.32,6.31,6.28,8.10,6.28,6.45,5.21*)

## Practicals (BYS-I-P) B.Sc. Part –I

1. Kriyas (Shatkarma)
2. Surya Namaskar
3. Sukshama Vyayama
4. Asana. (Basic set)
5. Eight step. Teaching tech. asana
6. Pranayama
7. Bandhas & Mudras
8. Omker Meditation
9. Relaxation technique[IRT,QRT,DRT]
10. Chanting
11. Yoga game
12. Emotions culture through Music, Patriotic, Service,- related songs
13. Kama yoga – Report writing
14. Presentation

**Books for Reference**
1. Yoga: Its basis and applications. - Dr.HR.Nagendra, SVYP, Bangalore.
2. Essence of Yoga- Swami Sivananda, The Divine life Society.
3. Light of Yoga- B.K.S Iyengar, Pub: Harper Collins India Pvt Ltd.
4. Yoga Sadhana(Hindi&English),Swami Anandananda,Yog Sadhna Ashram, Bapu Nagar, Jaipur(Raj.)
5. Yog Sikhsha(Hindi) Swami Satyanand Saraswati, Yog publication Trust, Mungare, Bihar.
6. Health&Yogasana-Swami Anandananda, Yog Sadhna Ashram, Bapu Nagar, Jaipur(Raj.)
7. Pranayama-KalaAur Vigyan(Hindi), Dr.H.R.Nagendra, SVYP, Banglore.
8. A Glimpse of Human Body-Dr. Shirley Telles.
9. Yoga for Comman Alliments- Dr.H.R.Nagendra, R.Nagrathan& Robin Monoro, SVYP, Banglore.
10. Yoga Way to Cure Disease, Swami Sivananda Saraswati.
11. Yog Darshana(Hindi)-Geeta Press ,Gorakhpur.
12. Yogic Chiktsa(Hindi)Swami Kuva.
13. Yogdipika(Hindi), B.K.S Iyengar, Orient Longman Pvt Ltd,New Delhi.
14. Bhagwat Geeta,Narada Bhakti Sutra,DshoUpnishad,(Hindi)Geeta Press, Gorakhpur.
15. Patanjali Yogsutra (Hindi),Yoga publication Trust, Mungare, Bihar.
16. Basic Book of Sanskrit Bharti.
*For more information : Refer to SVYP, Banglore-560 018.

**B.Sc PART-II**

**Scheme**

| | | |
|---|---|---|
| **Three papers** | **Min. Pass Marks: 48** | **Max Marks: 135** |
| **BYS-4** **3 Hrs Duration** | **Min. Pass Marks: 16** | **45 Marks** |
| **BYS-5** **3 Hrs Duration** | **Min. Pass Marks: 16** | **45 Marks** |
| **BYS-6** **3 Hrs Duration** | **Min. Pass Marks: 16** | **45 Marks** |
| **BYS-II-P** **5 Hrs** | **Min Pass Marks: 24** | **Max Marks: 65** |

## BYS-4: Yoga therapy(Modern & Ancient)

**Pattern of Paper Each paper is divided into 3 sections:**

Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)

Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)

Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

### Unit –I

Defination,Classification,types,sign and symptoms, Causes and yoga therapy: Respiratory- Bronchial asthma, Nasal allergy,  Endocrine- Diabetes mellitus, Obesity. Cardio-Vascular- Hypertension, Ischaemic heart disease. Digestive-Acid peptic pain, Irritable bowel syndrome.

### Unit –II

Defination,Classification,types,sign and symptoms ,Causes and yoga therapy : cardio-Vascular- Hypertension, Ischemic heart disease. Chronic pain – Arthritis, low back pain, Migraine, Tension, Headache, Cancer.

### Unit –III

Defination,Classification,types,sign and symptoms ,Causes and yoga therapy:  Reproductive – Menstrual disorders, Infertility, menopause, pregnancy, Eye problems-Error of Refraction, Glaucoma, Psychiatry & Neurology – Anxiety and Depressive Neurosis, Psychosis, Epilepsy, Phobia.

### Unit –IV

Remedial measures prescribed there in IAYT (Integrated Approach of Yoga therapy).The role of different Asanas,Pranayarna, Mudras, Bandha and Kiryas.

### Unit –V

Concept of Adhi and Vyadhi as found in Yoga Vasistha,The manner of destruction of mind,portrayed in defferent texts of Hatha yoga for dealing with different {Hath yoga Pradipika,Gharand shmita}


## BYS-5: YOGA & SPIRITUALITY

**Pattern of Paper Each paper is divided into 3 sections:**

Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)

Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)

Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)


### Unit –I

Upanishads the quintessence of Vedas, the basic of Yoga,[Meaning of upanishads,Imporatance, Amritnadopanishad,Ishawasyopainshad,Kathoupnishad,Chandogyaupanishad,Taittiryaupanishad,]

### Unit –II

Glimpse of each Upanishads,The style of Upanishad[Shali,bhav Bhasha] Harmony, Ego and beyond yogic practive.The pranavopanishad,Prasnaupanishad, Kenopanishad,Mandukyaupanishad, Mundakaupanishad, Glimpse of each Upainshads.


### Unit- III

A general survey of the life sketch, teachings and techniques of founders of various spiritual masters [Viveknand,Dayanand,Mahatma Ghandi, Ravindranath Tagore, Arvind, Tilak, Vinoba bhave,Ramkrishana paramhans,]
.

### Unit –IV

Dharma- concept, Definition,Features,Part-1 Epics[Ramayana, Mahabart, Geeta] Improtance of Dharma, Dharma and Science. Part-II[Hindu Dharma], Ideals of Dharmas-[Guru Dharma, pitra Dharma, shishya Dharma, Matra Dharmas,Mitra Dharma,Putra Dharma,Nari Dharma.]


### Unit –V

Comparative religions- Part-I Partially from comparative religion Islam, Christianity. Part-II- Partially from comparative religion other religion other religions, Buddhism, Jainism, Sufism,Dharma according to ancient india- Vedic kal,Uttar Vedic kal,Upanishad,Sutra kal.

## BYS-6: Patanjal YOGA TEXTS

**Pattern of Paper Each paper is divided into 3 sections:**

Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)

Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)

Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

Orientation Patanjali Yoga Sutra. Pantanjali Yoga Pradeepika text(Part-I). Sutra's 1 to 196.(Smadhi Pada & Sadhana Pada)

**Unit-I    1 to 39 Sutra's.**
**Unit-II 40 to 79 Sutra's.**
**Unit-III 80 to118 Sutra's.**
**Unit-IV   119 to 157 Sutra's.**
**Unit-V   158 to 195Sutra's.**

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**Practicals (BYS-II-P)           B.Sc. Part –II**

1. Advance Asana
2. Advance Kriyas
3. Pranayama – II
4. Cydic Meditation
5. Yoga Game-II
6. IAYT for promotion of positive health [Basic Set]
7. [Karma Yoga II- Min.20 classes]
8. IAYT for common ailments. [Special Technique]
9. Teaching Techniques for disease [Report writing & presentation]
10. Report Writing & Presentation    [Topic given by faculty]

**Books for Reference**
1. Essence of Yoga- Swami Sivananda, The Divine life Society.
2. Yoga Sadhana(Hindi&English),Swami Anandananda,Yog Sadhna Ashram, Bapu Nagar, Jaipur(Raj.)
3. Health&Yogasana-Swami Anandananda, Yog Sadhna Ashram, Bapu Nagar, Jaipur(Raj.)
4. Yoga-Vivekananda Kendra Prakashna,Madras.
5. Pranayama-KalaAur Vigyan(Hindi), Dr.H.R.Nagendra, SVYP, Banglore.
6. A Glimpse of Human Body-Dr. Shirley Telles.
7. Yoga for Comman Alliments- Dr.H.R.Nagendra, R.Nagrathan& Robin Monoro, SVYP, Banglore.
8. Yoga Way to Cure Disease, Swami Sivananda Saraswati.
9. Yogaic Chikatsa (Hindi)Swami Kuva.
10. Yogdipika (Hindi), B.K.S Iyengar, Orient Longman Pvt Ltd, New Delhi.
11. Bhagwat Geeta, Narada Bhakti Sutra,DshoUpnishad,(Hindi)Geeta Press, Gorakhpur.
12. Patanjali Yogsutra(Hindi),Yoga publication Trust, Mungare, Bihar.

13. Yoga for Bronchial Asthma,Dr. R.Nagrathana & Dr.H.R.Nagendra, SVYP, Banglore-560 018.
14. Yoga for Arthritis, Dr. R.Nagrathana&Dr.H.R.Nagendra, SVYP, Banglore-560 018.
15. Yoga For Hyper Tension& Heart Disease,
16. Dr. R.Nagrathana& Dr.H.R.Nagendra, SVYP, Banglore-560 018.
17. Yoga For Pregnancy, Dr. R.Nagrathana, Dr.H.R.Nagendra & Dr,Shamantakamani-Narendran, SVYP, Banglore- 560 018
18. Yoga for Diabetic,Dr. H.S.Shrikanta, Dr. R.Nagrathana& Dr.H.R.Nagendra, SVYP, Banglore-560 018.
19. Science of Holistic Living,Vivekanand Kendra Prakashan,Chennai.
20. Mukti ke Chaar Sopaan, Swami Styanand Saraswati, Mungare, Bihar.
*For other References: Refer to SVYP, Banglore-560 018.

## B.Sc. Part III

**Scheme**
**Three papers**          **Min. Pass Marks: 48**     **Max Marks: 135**
**BYS-7**      **3 Hrs Duration**          **Min. Pass Marks: 16**      **45 Marks**
**BYS-8**      **3 Hrs Duration**          **Min. Pass Marks: 16**      **45 Marks**
**BYS-9**      **3 Hrs Duration**          **Min. Pass Marks: 16**      **45 Marks**
**BYS-III-P**   **5 Hrs**                   **Min Pass Marks: 24**       **Max Marks: 65**

### BYS-7: Brain-Psychology And Naturopathy

**Pattern of Paper Each paper is divided into 3 sections:**
Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)
Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)
Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner-Maximum one from each unit (3X5=15)

### Unit – I
The nervous system, the voluntary and involuntary NS. Sympathetic and the parasympathetic NS.

### Unit –II
Cognition, IQ,memory, emotions, creativities functions, memory and learning.

### Unit-III
History of Naturopathy, Principals of Naturopathy, five elements-Space, Air, sun, Water, Earth. Foreign Matters-Definition, Origin, Effects on Body, Acute and chronic diseases.

### Unit-IV

Definition and clinical features, Eating habit, Raw eating-method and importance. Aims and Basis principles of Disease Prevention, Development of Physical, mental and spiritual health.

## Unit-V

Community sanitation and hygiene water supply, environment, health lows for Food  Din-charya and Ritu-charya ,health tri-dosha vata pitta, kapha, smoking, tea, coffee, drinks.

### BYS-8:          NATURE CURE METHODS AND PRACTICE

**Pattern of Paper Each paper is divided into 3 sections:**
Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)
Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)
Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

## Unit-I

Hydrotherapy- Physical properties of water, principles of hydrotherapy, physiological effects of water application on skin repiration,digestion,action and reaction. The technique of hydrotherapy water drinking, effusions, irrigation at rose, stomach colon and rectum, chest pack, trunk pack, T-packs, leg local, full wet sheet pack, hip bath, spiral bath, spinal bath, foot bath, vapour bath, and steam bath.

## Unit –II

Mud therapy – type of mud, collection and properties of mud, general and local mud applications, the physiological and pathological effects and contraindication.
          -

## Unit –III

Chromo therapy- Types of colors-primary and secondary, chromo    Philosophy, chromo hygienic, limitations of chromo therapy,  use of colors, limitations of chromo therapy.

## Unit- IV

Fasting- definition, difference between fasting and starvation, type of fast, short fast, intermediate fast, long fast, physiological effects of fast, how start fast, how to continue and how to breakfast, methods of fasting- water, juice, saline ,fruit, partial fast, mono diet fast, nutrition and dietetics- Classifications of food and drinks, deficiency diseases, artificial food and there Ill effects, acidic and alkaline food. Digestion, absorption and assimilation.

## Unit-V

Value of food in raw state, germinated form and cooked form, customs and manners of eating, combination of food, nutrition and its importance, balanced diet.Theory of massage, therapeutic use of massage, physiological effect of massage-upon skin, muscular system, circulatory system, digestive system and nervous system, massage, manipulations, hacking, stroking,percussion, petrispange,friction,tapotment,vibration and shaking

.

## BYS-9: STRESS MANAGEMENT AND YOGA RESEARCH

**Pattern of Paper Each paper is divided into 3 sections:**
Section A: Consists of 10 compulsory Questions of 1.5 (one and half) mark each. Word limit Max 50 words. Selection of question of Examiner- Maximum 2 from each unit (10X1.5=15)
Section B: Consists of 5 Questions of 3 (three) mark each with internal choice. Students are required to Attempt all five questions. Word limit Max 200 words. Selection of question of Examiner- Maximum 2 from each unit (5X3=15)
Section C: Consists of 5 Essay type Questions of 5 (five) marks each. Students are required to Attempt any 3 questions. Word limit Max 500 words. Selection of question of Examiner- Maximum one from each unit (3X5=15)

### Unit –I
Basic challenge of stress, Yogic concept of stress, Eustress and Distress, Physiology of stress. Stress induced problems and yogic management for stress.

### Unit –II
Stimulation- Relaxation combine- the core. Recognition is half the solution. Stress levels, Stimulations and pointed of awareness. Depth of Perception and expansion of awareness.
.

### Unit –III
Working through the group, progress in tune with nature, A Holistic life style for the effective stress Management.

### Unit –IV
Need for research in yoga and Yoga therapy. Research Methods Explorator studies,Pilot studies,open ended. Prospective studies,control studies,randomize studies,double blind studies.

### Unit –V
Measurement parameters,error and error analysis. Report preparation and presentation, Dissertation,data acquisition, analysis statistics, presentation format

**Practicals (BYS-III-P) B.Sc. Part –III**

**Part – I Personality Assessment**
1. General behavior

2.   Regular and Punctuality in the class.
3.   Charactor
4.   Emotional stability / Maturity
5.   Healthy habits and transformation (Internal


**Part – II  Clinical Project works**
        (Case study & Parameters of
            Min. 8 to 10 Cases)
**Part – III   Presentation**


**Books for Reference**

1.   Essence of Yoga- Swami Sivananda, The Divine life Society.
2.   Yoga-Vivekananda Kendra Prakashna,Madras.
3.   New Perspective in Stress Management- Dr.H.R.Nagendra, SVYP, Banglore.
4.   Yog Darshana(Hindi)-Geeta Press ,Gorakhpur.
5.   Research Methods, Dr.H.R.Nagendra & Shirley Telles,Vivekanand Kendra Yoga Prakashan,Banglore.
6.   Culture and Tradition of North East India, Vivekanand Kendra,Kanyakumari.
7.   Sure Way to Self Realization,Swami Styanand Saraswati,yoga publication Trust ,Mungare,Bihar
8.   Meditation from the Tantras, Swami Styanand Saraswati,yoga publication Trust Mungare, Bihar.
9.   New perspective in Stress Management,VKYP,Banglore.
10. Geeta Tatav Chintan,Swami Atmanand,Lokbharti Prakashna,Allahabad.
11. Vivekanand Sahitya, Vol: 1to10,Adwat Ashram,Calcutta.
12. Prakartick ayur vijayan, Dr. Rakesh  jindle.
13. Swathya vratth. Dr. Kashi Nath and jagrati Sharma.
*For other References: Refer to SVYP, Banglore-560 018.

# MAHARAJA GANGA SINGH UNIVERSITY, BIKANER

# SYLLABUS

## SCHEME OF EXAMINATION
## AND
## COURSES OF STUDY

## FACULTY OF LAW

## B.A. LL.B. 5 YEAR INTEGRATED



## © M.G.S. UNIVERSITY, BIKANER

# B.A. LL.B. 5 YEAR INTEGRATED
## (HONOURS COURSE FOR SESSION 2021-22)
### 1 st Year (Semester – I)
### Paper 1.1 English Language Skills I

**Teaching Hrs. L-06**                           **Exam Hrs. – 3**

**Total: 100 Marks (Internal 30 External 70)**

**Module 1: Phonetics, Word Formation and Punctuation**
    I. Transcription of Phonetic Symbols
    II. Word formation: Roots, Prefixing, Suffixing
    III. Punctuation and Capitalisation

**Module 2: Lexical Skills**
I.     Synonyms and Antonyms
II.    One Word Substitution
III.   Confusable Words
IV.    Phrasal Verbs and Idioms

**Module 3: Comprehension Skills**
    I. Skimming, Scanning, Intensive Reading and Extensive Reading (The students will be tested through an unseen Comprehensive Passage on Poetry and Prose)
    II. Precise Writing and Summarising

**Module 4: Compositional Skills**
    I. Note- Making and Note-Taking
    II.    Drafting of Petitions
    III.   Essay Writing

**Module 5: Legal Terms**
    (a) Legal Terms: Accused, Confession, Dying Declaration, FIR, Plaint, written statement, plaintiff, defendant, appeal, tribunal, divorce, legitimate, illegitimate, adoption, maintenance, alimony, valid void, litigation, monogamy, bigamy, polygamy, crime agreement, contract, fraud, minor indemnity, guarantee, bailment, pledge, libel, slander, defamation, homicide, gender, suicide, executive, legislature, judiciary, constitution, negligence, nuisance, precedent, mortgage, prospective, retrospective, ultra vires, will, summon, warrant, public & private.

**Suggested Readings**

Sasikumar,V., Dutta and Rajeevan. *A course in Listening and Speaking-I*. Founation Books, 2005.

Sawheny, Panja and Verma eds. *English at Workplace*. Macmillan, 2003.

Singh, R.P. *Professinal communication*. OUP, 2004.

Arthur Waldhorn and Arthur Zeiger. *English Made simple*. Rupa and co.

Gunashekar ed. *A Foundation English Course for Undergraduates Book I*.CIEFL,Hyderabad. Quirk and Greenbaum. *A University Grammar of English*. Longman,1973.

Thomoson, A.J. and A.V. Martinet. *A Practical English Grammar*. New Delhi OUP, 2005.

**Paper 1.2 History – I**
**HISTORY OF INDIA FROM EARLIEST TIMES TO 1206 A.D.**

Teaching Hrs.: L-04                                                     Exam Hrs. – 3
Total: 100                                                               Marks: Internal30
External 70

**Module : 1**
    Main sources of Ancient Indian History; Different Samvat (era) prevalent (used) in Ancient Indian History; Impact of Geography on Indian History and Culture; Features of Indus-Saraswati Civilization; Society, Polity, Economy, Culture and Religion as reflected in Vedic literature; the rise of Janpadas and Republics.

**Module : 2**
    Rise of Magadha upto the Nandas; Magadha Empire and contribution of Chandragupta Maurya; Ashoka – His Policies and Dhamma; Mauryan Administration, Cultural Achievements of Mauryan period; Causes of decline of the Mauryan Empire.

**Module : 3**
    Different political powers in Pre-Gupta period - Sunga, Satavahan, Saka and Kushana; Prominentrulers and their contribution in Pre-Gupta Period - Pushyamitra Sunga, Gautamiputra Shatkarni, Rudradaman I and Kanishka I; Economic Progress in the Pre-Gupta period with special reference to trade and commerce.

**Module : 4**
    Early History of the Gupta Dynasaty upto Chandra Gupta-I; Prominent Rulers of Gupta Dynasty and their achievements - Samudra Gupta, Chandra Gupta-II, Skand Gupta; Features of Gupta Administration; Cultural Revivalism and development of Science and Technology during Gupta Period.

**Module : 5**
    India in the Post-Gupta Period: Formation and Expansion of Vardhana Empire– Harsh; Features of Chola, Chalukya and Pallava administration; Sangam Age- Literature, Society and Culture; Tripartite Struggle, Contribution of Vigraharaja Chahamana, Kumara Pala Chalukya and Bhoja Parmara; Factors leading to disintegration of Rajput states.

**Select Bibliography:**
- R.S. Tripathi : History of Ancient India.
-  N.N. Gosh: Early History of India.
- R.K. Mookerji: Man and Thought in Ancient India.
- R.C. Majumdar: The History and Culture of the Indian People. Relevant volumes, Bhartiya Vidya Bhawan,
  Bombay.

**Paper 1.3 Economics-I (Micro Economics)**

Teaching Hrs.: L-04                                                     Exam Hrs. – 3
Total: 100                                                               Marks:    Internal    30
External 70

**Module : 1**
**Introduction:** Meaning, Nature and Scope of Micro Economics, Basic Economic Problems. Utility Analysis:  Law of Diminishing Marginal Utility, Equi-marginal utility.

**Module : 2**
    **Analysis of Demand:**  Concept, Elasticity and their types, Determinants and Importance of Elasticity of Demand Supply Analysis: - Concept and Law of Supply, Factors Affecting Supply.

**Module : 3**
    **Laws of Returns:** Production Function in Short-Run and Long Run. Revenue Concepts - Total Revenue, Marginal Revenue, Average Revenue and their relationship. Cost Analysis: - Accounting Costs and Economic Costs, Short Run Cost Analysis: - Fixed, Variable and Total Cost Curves, Average and Marginal Costs.

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**Module : 4**

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**Pricing Under Various Market Conditions:** Perfect Competition-Equilibrium of Firm and Industry under Perfect Competition. Monopoly: Price Determination. Monopolistic Competition: Price and Output Determination under Monopolistic Competition.

<div align="center">

**Module : 5**

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**Rent:** Concept, Meaning, Types, Theories of Rent–Classical and Modern; Quasi Rent; Wages: Meaning, Kinds and Theories; Interest: Concept, Gross and Net Interest, Theories of Interest: Classical, Neo – Classical, Liquidity Preference and Modern; Profit: Meaning, Characteristics, Gross and Net Profit, Theories of Profit.

**Select Bibliography:**
- Textbook of Economic Theory - Stonier and Hague; Longman Green and Co., London.
- Introduction to Positive Economics - Richard G. Lipsey
- Business Economics (Micro) - Dr. Girijashankar; Atharva Prakashan, Pune.
- Principles of Economics - M. L. Seth; Laxmi Narain Agarwal, Agra.
- Micro Economics - M. L. Jhingan; Vrinda Publications, New Delhi.
- Managerial Economics - Theory and Application - D. M. Mithani
- Micro Economic Theory – Dr. V. C. Sinha – Sahitya Bhawan, Agra.

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**Paper 1.4 Sociology-I**

</div>

Teaching Hrs.: L-04                                          Exam Hrs. – 3
Total: 100                                               Marks: Internal 30 External 70

<div align="center">

**Module 1 :     Basic Concepts**

</div>

Sociology, Meaning, Scope and Subject matter. Society, Community, Association, Institutes, Mores Social Group: Meaning and Classification of Social groups, Family, Traditional and Modern

<div align="center">

**Module 2 :     Pioneers of Social Thought**

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Auguste Comte: Law of three stages, Positivism and Religion of humanity, Emile Durkhum: Social Solidarity, The theory of Division of Labour, theory of Religion and Suicide, Karl Marx:Maxim Concept of Social change, Class struggle, Division of Labour, Marweber : Sociology of Religion, The Concept of authority and the Concept of Social action

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**Module 3 :     Social Change and Social Control**

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Social Change, meaning, factors, Distinction between Social and Cultural Change, Social Control, Meaning and importance of Social control, Means of Social Control, Public opinion and propaganda, Renowned and Punishment, Agencies of Social Control: Religion, Family and State

<div align="center">

**Module 4 :     Sociology of Profession**

</div>

Profession and Professionalisms, Distinction between Profession and Occupation. Society and Professional Ethics, Sociology of Law, Relationship between Law and Society.

<div align="center">

**Module 5 :**

**Sociological School of Jurisprudence**

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 Rosco Pound, Duguit, Ihering, Ehrlich
**Select Bibliography:**
- Maclver & Page 'Society': An Introductory Analysis
- M.Haralambos 'Sociology': Theme and Perspectives
- T.B.Bottomore 'Sociology': A Guide to problems and Literature
- David G. Mandelbaum 'Society in India'
- Ram Ahuja, Society in India.
- M.S.A. Rao, Urbanization and Social Change
- Yogendra Singh, Modernization of Indian Tradition
- Abraham: Social Thinkers
- Roueek: Social Control
- K.M. Kapadia :Marriage & Family in India.

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**Paper 1.5 Legal methods**

</div>

**Teaching Hrs. : L-04**

**Exam Hrs. – 3**

**Total : 100**

**Marks : Internal 30 External 70**

**Module : 1**

Concept of law, meaning and definitions, Concept of Justice, stability and peaceful change

## Module : 2

Classification of law, kinds of law-International law and municipal law, Public law and Private law.

## Module : 3

**Principals and sources of Law:** Basic concept of Indian legal system, Rule of Law, Separation of powers, Constitutionalism, Principles of natural justice, Sources of law: Custom, Legislation, Precedent and Equity as sources of law

## Module : 4

**Legislative Procedure:** Kinds of Bills, Kinds of Legislations, Supreme and Subordinate, Meaning and kinds of delegated legislation, reasons for its growth conditional legislation, safeguards against delegated legislation

## Module : 5

Legal clinical methods

**Select Bibliography:**
- Avtar singh-Jurisprudence
- A.K.Anthony- Law for laymen
- B.M.Tripathi - Jurisprudence
- Cardozo-Nature of Radical Process
- Glaniville Williams
- I.L.I. Publication on Legal Research
- N.R. Madhva Menon- Clinical legal Education
- V.D. Mahajan--Jurisprudence

## Paper 1.6 Law of Contract – I

**Contract-I (General Principles of Contract and Consumer Protection Act, 2019)**

**Teaching Hrs.: L-04**

**Exam Hrs. – 3**

**Total : 100**

**Marks : Internal 30 External 70**

## Module : 1

History and nature of contractual obligations. Agreement and contract: definitions, elements, characteristics and kinds. Proposal and acceptance - various forms, essential elements, communication and revocation - proposal and invitation to proposal, floating offers, tenders. Consideration - need, meaning, kinds, essential elements - Privity of contract and of consideration - its exceptions, adequacy of consideration, present, past and future Consideration, unlawful consideration and its effects.

## Module : 2

**Capacity to Contract** - meaning - incapacity to contract - minor's Agreements definition of 'minor', necessaries supplied to a minor, agreements beneficial and detrimental to a minor, affirmation-restitution in cases of minor's agreements, fraud by a minor, agreements made on behalf of a minor, minor's agreements and estoppels.

**Consent -Free consent - Its need, definition and factors vitiating free consent.**

Coercion-definition, essential elements, duress and coercion Various illustrations of coercion, doctrine of economic duress, effect of coercion, Undue Influence-definition, essential elements, parties between whom such influence is presumed, where liability to prove the existence of undue influence, independent advice, Pardahanashin women, unconscionable bargains, effect of undue influence, misrepresentation - definition,

misrepresentation of law and of fact, their effects and illustration, Fraud-definition, essential elements-suggestions, when does silence amounts to fraud?, Active-concealment, importance of intention. Mistake - definition, kinds, fundamental error, mistake of law and of fact, their effects.

## Module : 3

**Legality of objects:** Void and voidable agreements - void, voidable, illegal and unlawful agreements and
their effects, Lawful and unlawful considerations and objects, Void Agreements - Agreements without consideration, Agreements in restraint of marriage, Agreements in restraint of trade, its exceptions - sale of goodwill, section 11 restrictions, exclusive dealing agreements, restraints on employees under agreements of service, Agreements in restraint of legal proceedings - its exceptions, Uncertain agreements, Wagering agreement-its exception.

**Discharge of a contract and its various modes.**
By performance-conditions of valid tender, Performance of reciprocal promises, time as essence of contract, By breach-anticipatory breach and present breach, Impossibility of performance - specific grounds of frustration-application to leases, theories of frustration, effect of frustration, frustration and restitution, By period of limitation, By agreement - rescission and alteration, their effect, remission and waiver of performance, extension of time - accord and satisfaction.

## Module : 4

**Quasi-contracts or certain relations resembling those created by contract. Remedies in contractual relations;**
Damages-kinds, remoteness of damages, ascertainment of damages, Injunction - Refund and restitution, Specific performance

**Government as a Contracting Party**
Constitutional provisions - government power to contract -procedural requirements.

**Standard Form Contracts**
Nature, advantages - unilateral character, principles of protection against the possibility of exploitation, judicial approach to such contracts, exemption clauses, clash between two standard form contracts.

## Module -5

**The Consumer Protection Act - 2019**

**Leading Cases**
- Carlil v. Carbolic Smoke Ball Company (1883) I.Q.B.256.
- Bhagwan Das v. Girdhari Lal & Company. AIR 1966. S.C.543.
- Lalman Sukha v. Gauri Dutt All. IJ (1913) 409.
- Mohri Bibi v. Dharmodas Ghose (1903) I.A.172.
- Indian Medical Association v. V.P. Shantha, AIR 1996 SC 500
- J.J. Merchant v. Shrinath Chaturvedi, AIR 2002 SC 2931

**Select Bibliography:**
- Beatsen (ed.), Anson's Law of Contract (27th ed. 1998).
- P.S.Atiya, Introduction to the Law of Contract 1992 reprint (Claredon Law Series).
- Shree Ram Singh – Law of Contract, Central Law Publication, Ed. 7, 2016
- Kailash Rai – Law of Contract
- R.K. Bangia – Law of Contract
- Avtar Singh, Law of Contract (2000) Eastern, Lucknow.
- G.C.Cheshire, and H.S. Fifoot and M.P. Furmston, Law of Contract (1992)
- ELBS with Butterworths M.Krishnan Nair, Law of Contracts, (1998).
- G.H. Treitel, Law of Contract, Sweet & Maxwell (1997 Reprint).
- R.K. Abichandani, (ed.), Pollock and Mulla on the Indian Contract and the Specific Relief Act (1999), Tripathi.
- Anson, Law of Contract (1998), Universal.
- Avtar Singh - Law of Contract.
- Gurbax Singh - Law of Consumer Protection.
- P. Leela Krishna - Consumer Protection & Legal Contract.
- Avtar Singh, Law of Consumer Protection.

# B.A. LL.B. 5 YEAR INTEGRATED
## (HONOURS COURSE FOR SESSION 2021-22)
### 1 st Year (Semester – II)
### Paper 2.1 English Language Skills II

**Teaching Hrs. L-06**                                          **Exam Hrs. – 3**

**Total: 100 Marks (Internal 30 External 70)**

**Module: 1 Transformations**

    I.   Affirmative to Negative
    II.  Affirmative to Interrogative (Yes-No, Wh questions)
    III. Simple to Compound and Complex
    IV. Compound to Simple to Complex
    V.  Complex to Compound and Simple
    VI. Active and Passive Voice
    VII. Direct and Indirect Narration

**Module: 2 Grammar & Usage**

    I.   Parts of speech: Nouns, Adjectives, Adverbs, Verbs, Pronouns, Auxiliaries, Determiners, Conjunctions, Prepositions, Enumerators, Interjections
    II.  Tenses and their Sequence

**Module: 3 Comprehensional Skills**

Comprehension based questions from *Emerald* and *RISE*

**Module: 4 Composition Skills**

    I. CV and Job Application
    II.     Writing of Legal Case Comments
    III.    Report Writing (With an emphasis on reports related to legal issues)
    IV.    Paragraph Writing on topics of Legal Interest

**Module: 5 Law & Literature (For non-detailed study)**

    I. *To Kill a Mockingbird* by Lee Harper
    II. *Roses in December* by M.C.Chagla
    III. *The Autobiography of Martin Luther King*

**Required Reading**

Agrawal, S.K. *RISE: COVID Stories of Hemang Rastra.* Jaipur: Baba Publication, 2020.

Agrawal, S.K.et al. *Emerald: A Coursebook for General English*. Macmillan Publishers India Private Ltd.

Judith Leigh.*CVs and job Applications*.OUP, 2004.

Quirk and Greenbaum. *A University Grammar of English*. Longman,1973.

Leech, Geoffrey, Margaret Deuchar and Robert Hoogienraad. *English Grammar for Today*. Macmillan.

Thomoson, A.J. and A.V. Martinet. *A Practical English Grammar*.  New Delhi OUP, 2005.

**Paper 2.2 Political Science -  I**

Teaching Hrs.: L-04                                                    Exam Hrs. – 3
Total : 100                                                              Marks : Internal 30 External 70

**Module : 1**
Political Science: Meaning, Nomenclature and scope; Traditional and Contemporary Perspectives of Political Science, Behaviouralism and Post Behaviouralism, Relations of Political Science with other Social Sciences (Economics, History and Sociology)

**Module : 2**
State: Theories of the Origin (Divine Origin, Social Contract, Evolutionary Theory and Marxist Theory), Nature of the State - Organic theory of the State, the Concept of Welfare State, Sovereignty : Monistic and Pluralistic theories.

**Module : 3**
Basic Concepts: Power, Authority and Legitimacy, Rights, Liberty, Equality, Justice and Law.

**Module : 4**
Democracy and Dictatorship, Parliamentary and Presidential Systems, Unitary and Federal Systems. Political Parties, Pressure Groups. The Concept of Minority Representation and Proportional Representation.

**Module : 5**
Organs of Government and their Functions with reference to recent trends, Theory of Separation of Powers. Good Governance and Globalization.

**Paper 2.3 Economic – II**
**Macro – Economics**

Teaching Hrs. : L-04                                                   Exam Hrs. – 3
Total : 100                                                              Marks : Internal 30 External 70

**Module : 1**
Macroeconomics– An overview, Concept, Nature, Limitations, Significance, Static, Dynamic, Comparative.
National Income – Meaning, Flow concept, Measurement, Problems

**Module : 2  Important Policies (elementary) New economic Policy**
Liberalization – Concept, Impact and Extent. Privatization – Concept, Impact, Extent and Mode.
Globalization – Concept, Impact and Extent. Monetary Policy – Meaning, Objectives, Significance.  Fiscal Policy – Meaning, Objectives, Significance.

**Module : 3 Theories of Macroeconomics**
Classical Theory Income and Employment – Introductory analysis (Says Law & Wage Price Flexibility)  Keynesian Theory of Employment: An Overview. Balance of Payment & Balance of Trade: Meaning, Current Account & Capital Account

**Module : 4 Money**
Nature and functions of Money. Supply of money and types of Money. Fishers Quantity theory of Money.

**Module : 5  Banking**
Commercial Banks – Meaning, Functions including Credit Creation. • Central Bank: Meaning,Function and Methods of Credit Control.

**Select Bibliography:**
- Jhingan M.L., Macro-Economic Theory, Vrinda Publication Ltd.
- Vaish M.C. Vaish, Macro-Economic Theory, Vikas Pub.
- Ahuja H.L., Macroeconomics- Theory and Policy, S. Chand & Company Ltd.

<div align="center">**Paper 2.4  Sociology– II**</div>

**Teaching Hrs. : L-04**                                        **Exam Hrs. – 3**
**Total : 100**                                        **Marks : Internal 30 External 70**

<div align="center">**Module : 1**</div>

Development of Indian Society, Development from Vedic to Post Vedic Society, Indian traditional order, Ashram and Varna, System, Sanskars, Indian Cultural Values and their importance

<div align="center">**Module : 2      Composition of Indian Society**</div>

Rural and Urban Society, Meaning and their characteristics, Rural-Urban Linkage, Geographical determination, Social stratification and its traditional basis, Joint family : meaning, characteristics, merits and demerits, Caste: meaning, characteristic, merits and demerits and recent changes in the Caste System, Caste and class in India

<div align="center">**Module : 3      Weaker Sections of Society in India**</div>

Schedule Caste, Minorities, Tribes: Meaning, Features, Problem and their Classification, Other Backward Class.

<div align="center">**Module : 4      Trends of Social change in India**</div>

A Shift from Tradition to Modernity. Process of Westernization, Modernization, Globalization, Sanskritization, Liberalization, National building and Women empowerment

<div align="center">**Module : 5**</div>

(a) i.  Customs Meaning, Importance
  ii.  Modes of Acquiring Customs ( Languages Symbolic Interaction)
(b) i.  Problems and Perspectives Lingusta Communities
  ii.  Problems and Perspectives of Religions Communities
  iii.  Role of Legislation

<div align="center">**Paper 2.5  Legal and Constitutional History of India**</div>

**Teaching Hrs. : L-04**                                        **Exam Hrs. – 3**
**Total : 100**                                        **Marks : Internal 30 External 70**

<div align="center">**Module : 1      Early Developments (1600-1836):**</div>

Charters of the East India Company: 1600, 1661, Settlements: Surat, Madras, Bombay and Calcutta, Courts: Mayor's Court of 1726 and Supreme Court of 1774.

<div align="center">**Module : 2**</div>

Statutes: Regulating Act, 1773, Pitts India Act, 1784, The Act of Settlement, 1781, Conflict: Raja Nand Kumar, Patna Case and Cossijurah Case, Warren Hastings: Judicial Plans of 1772, 1774 and 1780, Lord Cornwallis: Judicial Plans of 1787, 1790 and 1793, Lord William Bentinck (With special focus on Appraisal of Criminal Law)

<div align="center">**Module : 3      Evolution of law and legal institutions:**</div>

Development of law in Presidency Towns, Development of Civil law in Mufassil: Special emphasis on justice, equity and good conscience, Codification of laws: Charter of 1833, the First Law Commission, the Charter of 1853, The Second Law Commission, Establishment of High Courts, 1861, Privy Council and Federal Court: Appeals and working of Privy Council, Evaluation: Special Reference to Racial Discrimination, Merit and Demerits

<div align="center">**Module : 4**</div>

The Indian Councils Act, 1861 ; The Indian Councils Act, 1892 ; The Indian Councils Act, 1909 ; The Government of India Act, 1919

<div align="center">**Module : 5**</div>

The Government of Indian Act, 1935 (Nature and characteristics under the Act, Executive Powers of Governor General, Federal Legislature, Federal Court), Indian Independence Act 1947

**Select Bibliography:**

- Jain,M.P: Outlines of Indian Legal History
- Keith, A.B: Constitutional History of Indian (1973), Chapters VII, VIII,X,XI and XII only.
- Banerjee,A.C: The Making of the Indian Constitution
- Jois,M.Rama: Legal History of India

- Kulshrashtha, VD: Landmarks in Indian Legal and Constitutional History.
- Jain,M.P: Bharatka Vidhi ka Itihas
- Mittal,J.K.: Bharat ka Vaidhanik avam Samvedhanik Itihas.

## Paper 2.6 Law of Contract – II
### (SPECIFIC CONTRACTS, SALE OF GOODS ACT, 1930, INDIAN PARTNERSHIP ACT, 1932 AND SPECIFIC RELIEF ACT, 1963)

**Teaching Hrs. : L-04**                                           **Exam Hrs. – 3**
**Total : 100**                                    **Marks : Internal 30 External 70**

### Module : 1    Indemnity
The concept, Need for indemnity to facilitate commercial transactions, Methods of creating indemnity obligations, Definition of Indemnity, Nature and extent of liability of the indemnifier, Commencement of liability of the indemnifier, Situations of various types of indemnity creations, Nature of indemnity clauses.

**Guarantee**
The concept, Definition of guarantee: as distinguished from Indemnity, Basic essentials for a valid guarantee contract, The place of consideration and the criteria for ascertaining the existence of consideration in guarantee contracts, Position of minor and validity of guarantee when minor is the principal debtor, creditor or surety, Continuing guarantee, Nature of surety's liability, Duration and termination of such liability, Position of surety in the eye of law, Various judicial interpretations to protect the surety, Co-surety and manner of sharing liabilities and rights, Extent of surety's liability, Discharge of surety's liability.

### Module : 2    Bailment
Identification of bailment contracts in day today life, Manner of creation of such contracts, Definition of bailment, Kinds of bailees, Duties of Bailor and Bailee towards each other, Rights of bailor and bailee, Finder of goods as a bailee, Liability towards the true owner, Obligation to keep the goods safe, Right to dispose off the goods.

**Pledge**
Pledge: comparison with bailment, Commercial utility of pledge transaction, Definition of pledge transactions, Definition of pledge under the Indian contract Act, Rights of the pawner and pawnee, Pawnee's right of sale as compared to that of an ordinary bailee, Pledge by certain specified persons mentioned in the Indian Contract Act.

### Module : 3    Agency
Identification of different kinds of agency transactions in day to day life in the commercial world, Kinds of agents and agencies, Distinction between agent and servant, Essentials of a agency transaction, Various methods of creation of agency, Delegation, Duties and rights of agent, Scope and extent of agent's authority, Liability of the principal of acts of the agent including misconduct and tort of the agent, Liability of the agent towards the principal, Personal liability towards the parties, 10 Methods of termination of agency contract, Liability of the principal and agent before and after such termination.

**Specific relief under Specific Relief Act, 1963**
Specific performance of contract, Contract that can be specifically enforced, Persons against whom specific enforcement can be ordered. Rescission and cancellation, Injunction-Temporary, Perpetual, Declaratory orders.

### Module : 4    Sale of Goods
Concept of sale as a contract, Illustrative instances of sale of goods and the nature of such contracts, Essentials of contract of sale, Essential conditions in every contract of sale, Implied terms in contract of sale, The rule of caveat emptor and the exceptions thereto under the Sale of Goods Act, Effect and meaning of implied warranties in a sale, Transfer of title and passing of risk, Delivery of goods: various rules regarding delivery of goods, Unpaid seller and his rights, Remedies for breach of contract, Concept of nemo dat quad non habet with exceptions.

### Module : 5    Partnership

Nature of partnership: definition, Distinct advantages and disadvantages vis-a-vis partnership and private limited company, Mutual relationship between partners, Authority of partners, Admission of partners, Outgoing of partners, Registration of Partnership, Dissolution of Partnership. Limited Liability Partnership Act, 2008.

**Leading Cases:**
- National Bank of India Ltd. v. Sohan Lal, AIR 1962. Punjab 534.
- Amrit Lal Gordhan Lallan v. State Bank of Travancore, AIR 1960 S.C.1432.
- Patnaik & Company v. State of Orissa, AIR 1965 S.C. 1655.
- State of Gujarat v. Maman Mohd., AIR 1967 S.C. 1885.

**Select Bibliography:**
- R.K. Abhichandani (ed.), Pollock and Mulla on Contracts and
- Specific Relief Acts (1999) Tripathi, Bombay.
- Avtar Singh, Contract Act (2000), Eastern, Lucknow.
- Krishnan Nair, Law of Contract, (1999) Orient
- Avtar Singh, Principles of the Law of Sale of Goods and Hire Purchase (1998), Eastern, Lucknow.
- J.P. Verma (ed.), Singh and Gupta, The Law of Partnership in India (1999), Orient Law House, New Delhi.
- A.G.Guest (ed.), Benjamin's Sale of Goods (1992), Sweet & Maxwell.
- Beatson (ed.), Ansons' Law of Contract, (1998), Oxford, London.
- Saharay, h.k., Indian Partnership and Sale of Goods Act (2000), Universal
- Ramnainga, The Sales of Goods Act (1998), Universal

- Dasai S.T. The Law of Partnership in India and Pakistan.
- Kapoor N.D. - Mercantile Law (Hindi & English).

# B.A. LL.B. 5 YEAR INTEGRATED
(HONOURS COURSE FOR SESSION 2022-23)
### 2nd Year (Semester – III)

### Paper – 3.1  Computer - I

**Teaching Hrs. : L-04**                                    **Exam Hrs. – 3**
**Total : 100**                                    **Marks : Internal 30 External 70**

### Module : 1
Introduction to operating system; functions of OS, Types of Operating system, Booting Procedure, system files, Windows XP/2000. Windows concepts, Features, Windows structure, Desktop, Taskbar, Start menu, My Computer, Recycle Bin, Windows Accessories-Calculator, Notepad, Paint, WordPad, Character Map, Windows Explorer, Entertainment, Control panel, managing Hardware & Software- installation of Hardware and Software, System Tools, Communication.

### Module : 2
**Introduction to Computer:** Definition, Characteristics. Capabilities and Limitations. Evaluation of Computers Classification of computers, Microcomputers, Minicomputers, Mainframes, Supercomputers, Personal computers Desktop, Laptop, Palmtop, Tablet PC, Basic Components of a Computer System- Control Module, ALU, Input/output functions and characteristics.

Memory Introduction, Classifications- Volatile Memory and Non- Volatile , Flash Memory, ROM, RAM, EPROM, PROM, EEPROM other types of memory

### Module : 3
Input, Output and storage units, Computer Keyboard, Pointing Devices: Mouse, Trackball, Touch Panel, and Joystick, Light Pen, Scanners, Various types of Monitors, Touch-sensitive screens, Optical Recognition System, Pen based systems, Digitizers, MICR, OCR, OMR, Bar-code Reader, digital camera.

**Hard Copy Devices:** Impact and Non- Impact Printers- Daisy Wheel, Dot Matrix, Line Printer, Chain Printer, Comb Printers, Non Impact Printers- DeskJet, Laser Printer, Thermal Transfer Printer, Barcode Printers, Electro static printers and plotters.

## Module : 4

High Level Language and Low Level Language, Software and its different types- System Software, Application software. Hardware , Firmware Introduction to algorithm and Flow chart: - Representation of an algorithm, flowchart symbols and levels of flow chart, rules, advantage and limitations of flowchart

## Module : 5

Introduction to Networking Concepts, Types of networking (LAN, MAN AND WAN), Communication Media, Introduction to Database Management System and its uses. Introduction to internet ,advantages limitations and services, Internet Tools include: email, ftp, E-commerce ,telnet the World Wide Web, and search engines and Computer Virus.

**Select Bibliography:**
- Computer Fundamentals : Pradeep K. Sinha. Priti Sinha BPB Publications
- Fundamentals of Computers : V.Rajaraman ,Prentice Hall of India Private Ltd.
- PC Software : Dr. Neeraj Bhargava , Mrs. Ritu Bhargava, Mr.Ajay Singh Gaur , Mr. Rajesh Kalra , University
  Book House Pvt. Ltd.

**Computer Lab :**

Computer Lab to be used for the following: Windows, managing windows, working with M S Word, M S Excel and M S Power Point

**Introduction to M S Dos:**
Internal Commands MD, CD, RD, COPY CON, TYPE, DATE & TIME, ,REN, PROMPT, CLS, DIR/P/W, COPY , DEL Etc. External commands - FORMAT, DISKCOPY, DISKCOMP, XCOPY, CHKDISK, SCANDISK, HELP, DEBUG, PRINT etc.

**Introduction to M S Word:**
1. Working with formatted text, Menu Bar, Shortcut keys, Formatting documents: Selecting text, Copying & moving data, Formatting characters, changing cases
2. Paragraph formatting, Page formatting, Header & footer, Bullets & numbering, forming tables. Finding & replacing text, go to (F5) command,
3. Printing documents, page, break, auto text, symbol, picture & word art.
4. Spelling & grammar, word count, auto correct and mail merge

**Introduction to M S Excel:**
1. Spreadsheets, workbooks, creating, saving & editing a workbook
2. cell entries (numbers, labels, and formulas)
3. Adding and deleting rows and columns Filling series
4. data sort, Formatting worksheet
5. Some useful Functions in excel (SUM, AVERAGE, COUNT, MAX, MIN, IF), Cell referencing
6. Introduction to charts: types of charts, creation of chart.

**Introduction to M S Power Point:**
1. Presentation tips, components of slide, templates and wizards, using template, choosing an auto layout, using outlines
2. adding subheadings, editing text, using master slide, adding slides, changing background and shading, adding header and footer, adding clip arts and auto shapes
3. Working in slide sorter view (deleting, duplicating, rearranging slides)
4. adding transition and animations to slide show
5. inserting music or sound on a slide, Inserting action buttons or hyperlinks for a presentation
6. set and rehearse slide timings, viewing slide show

**Paper – 3.2  History – II**

# MEDIEVAL INDIA AND INSTITUTIONS (1526-1656 A.D)

**Teaching Hrs. : L-04**                                          **Exam Hrs. – 3**
**Total : 100**                                          **Marks : Internal 30**
**External 70**

## Module : 1

India's political system on the eve of Babur's invasion. Nature of Babar's achievements in India. Importance of Babarnama as a source of History. Humayun's relations with his brothers and the role of Nobility. Problem of Malwa and Gujarat.

## Module : 2

Mughal relations with Afghans (Shershah) and Rajputs under Babur and Humayun. Sher Shah – Sources of Study. Administration Reforms and Achievements.

## Module : 3

Akbar - Sources with special reference to the works of Nizamuddin, Abul Fazal and Badauni. Relations with Nobility and Rajputs. Relations with Central Asian power, Deccan Policy.

## Module : 4

Growth of Administrative machinery Central, Provincial, Revenue and Army Administration (Mansabdari system) Theory of sovereignity and growth of religious ideas & Suleh-kul.

## Module : 5

Jahangir- Parties and politics at Jahangir's Court and the Nurjahan 'junta'. Growth of

Administration. Shah Jahan - North–West frontier and Central Asian policy. Relations with Rajputs and Deccan problem. Source- "Tuzuk-i-Jahangiri", Iqbalnama-i-Jahangiri and Badshahnama of Quzwini and Lahori.

**Select Bibliography:**

- R.P.Tripathi: (i) Rise and Fall of Mughal Empire. (ii) Some Aspects of Muslim Administration in India.
- Rushbrook Williams : An Empire Builder of the Sixteenth Century.
- S.K. Bannerji : Humayun Badshah.vol I
- William Erskine : History of India. Vol. I.
- Ishwari Prasad : Life and Time of Humayun.
- K.R. Qanungo : Sher Shah and his Times.
- Harbans Mukhiya : Historians and Histrography during the reign of Akbar.
- Moreland: India at the Death of Akbar.
- Irfan Habib: The Agrarian system of the Mughal India.
- Beni Prasad : History of Jahangir  B.P. Saxena: Shahjahan of Delhi.

## Paper – 3.3  Political Science– II
### Modern Indian Social and Political Thought Duration

**Teaching Hrs. : L-04**                                          **Exam Hrs. – 3**
**Total : 100**                                          **Marks : Internal 30 External 70**

## Module : 1

The Nature and Content: Genesis of Indian Thought and Compulsion of National Movement, Synthesis of Thought and Activation, Contact with the west and the Nature of Impact. Thought of Socio-Religious Regeneration : Socio-Religious Reform proceeding, Political Evolution, Protest and Reforms-Institutional bases. Ram Mohan Ray, Social Justice, Religion and Humanism. Dayanand: Social Equality, Integration and Justice: Nationalism and Internationalism. Modern India & Swami Vivekanand.

## Module : 2

Liberal Foundations: The Vision of M.G. Ranade & G.K. Gokhale: The British connection, Loyalty and National Self Respect, Spiritualization of Politics, The issue of Purity and Primacy of Means of Protest:

Modernization and Constitutionalism, Social Regeneration and National Consolidation, Secularism, Self Government. Economic Nationalism: Dadabhai Naoroji, Theory of Moral and material Drain. M.G.Ranade's Alternative, G.K. Gokhale's Views on Protection and Free Trade, Economic Regeneration and the States.

## Module : 3

Militant Nationalist Foundations: B.G.Tilak's Perspectives of The British connection, Means of Protest: Resistance, Boycott Non-Cooperation, The Concept of Swaraj, National Dignity and National Reconstruction thought, National Education and Swadeshi, Social Reforms, Political Evolution, Shift in view after 1915. The Moderate Perspectives. Lajpat Rai's Perspective of Social Justice and National Integration, Nationalism, Religion, Social Reforms and Political Evolution. Denominational Response to Nationalism : Syed Ahmed Khan and M.A. Jinnah: Views on the British Rule and Muslims in India, Inadequacies of Parliamentary-democrat Process, Secularism and Nationalism, Religion, Social- Order and Political Separatism, The Two Nation Theory.

## Module : 4

V.D.Savarkar's Concept of Hindutav, Bases of Integrative Nationalism: Aurobindo: Cultural Spiritual Basis of Nationalism, Militant Nationalism and Resistance: Humanism, Universalism. Rabindranath Tagore`s Nationalism and Universalism. Bases of Socialism and democracy: M.N. Roy`s Transition from Marxism to Radical Humanism, The New Social Order.

## Module : 5

Jawaharlal Nehru: Liberal and Socialist Influences: Nationalism and World Order, Social Integration, Secularism, Nation Building, Democracy, Socialism, Planned Economic Development and Industrial Growth. B.R. Ambedkar: Social Justice and Social Integration, Nationalism, Constitutional Framework, Rule of Law and Nation Building. M. K. Gandhi's Thought and the Legacy: Formative Influences of Thought Process. Religion and Politics, Truth, Non-Violence, Satyagraha, Non-Co-operation and Boycott, Perspective of Western Civilization, Parliamentary Democracy, Science and Technology, State and Statelessness, Bread Labour, Economics Justice and Trusteeship, Universal Humanism, Relevance of Gandhi's Alternatives; Social, Economic and Political Base, of Sarvodaya : Views of Gandhi, Vinoba and Jayaprakash Narayan; Communist Thought and Activism in India : Major Ideological Dimensions and Contribution.

**Select Bibliography:**

- A. Appadorai: Indian Political Thinking From Naoroji To Nehru
- K.P. Karunakaran: Continuity and Change In Indian Political
- V.P. Verma: Modern Indian Political Thought
- P.L. Nagar: Adhunik Bharatiya Samajik Avam Rajnitik Chintan
- O. P. Goyal: Studies In Modern Indian Political Thought
- A.R. Desai: Social Background of Nationalism
- V.R. Mehta: Ideology, Modernization and Politics In India
- K.D. Damodaran: Indian Thought
- Bhavani Sen Gupta: Communism In Indian Politics
- K.P. Karuakaran: Continuity and Change In Indian Politics
- Virendra Grover : Bal Gangadhar Tilak
- Shyamlal and K.S. Saxena : Ambedkar and Nation Building(Ed.)
- K.P Karunakaran : Religion and Political Awakening In India
- B.R. Purohit : Hindu Revivalism and Indian Nationalism
- Lal Bhadur : The Muslim League
- V.V.Ramana Murti : Non-Violence In Politics
- B.S.Sharma : The Political Philosophy of M.N. Roy
- D.B.Mathur : Gopal Krishan Gokhale
- Appadorai : Documents On Political Thought In Modern India
- G.N. Dhawan : Political Philosophy of Mahatma Gandhi
- K.P. Karuna Karan : Modern Indian Political Tradition
- Karan Singh : Aurobindo - The Prophet of Indian Nationalism

- M.A. Dass : The Political Philosophy of Jawahar Lal Nehru
- M.M. Buch : Rise and Growth of Indian Liberalism : Rise and Growth of militant nationalism
- Raman Murthy  : Non-Violence In Politics
- Shay : The Legacy of Lokmanya

- V.R. Mehta : Foundations of Indian Political Thought
- C.F. Andrews and G. Mukherjee : Rise and Growth of The Congress In India
- S.A. Wolepert : Tilak and Gokhale

## Paper 3.4 LAW OF TORTS AND MOTOR VECHICLE ACT

**Teaching Hrs. : L-04**                                     **Exam Hrs. – 3**
**Total : 100**                                     **Marks : Internal 30**
**External 70**

### Module : 1     Evolution of Law of Torts
England- forms of action - specific remedies from case to case, India - principles of justice equity and good conscience - uncodified character, advantages and disadvantages.
**Definition, Nature, Scope and Objects**
A wrongful act - violation of duty imposed by law, duty which is owed to people generally (in rem), damnum sine injuria and injuria sine damnum, Tort distinguished from crime, breach of contract and Quasi Contract, The concept of unliquidated damages, Changing scope of law of torts : Objects - prescribing standards of human conduct, redressal of wrongs by payment of compensation, prescribing unlawful conduct by injunction.
**Principles of Liability in Torts**
Fault, Wrongful intent, negligence, Liability without fault, Violation of ethical codes, Statutory liability, Place of motive in torts.

### Module : 2     Justification in Tort
Volenti non fit injuria, Necessity, private and public, Plaintiff's default, Act of God, Inevitable accident, Private defence, Statutory authority, Judicial and quasi-judicial acts, Parental and quasi-parental authority.
**Extinguishment of liability in certain situations**
Actio personalis moritur cum persona - exceptions, Waiver and acquiescence, Release, Accord and satisfaction, Limitation.
**Standing**
Who may sue-aggrieved individual - class action - social action group, Statutes granting standing to certain persons or groups, Who may not be sued?
**Doctrine of sovereign immunity and its relevance in India Vicarious Liability**
Basic, scope and justification, Express authorization, Ratification, Abetment, Special relationships: Master and servant - arising out of and in the course of employment - who is master? - the control test, who is servant? - borrowed servant, independent contractor and servant, distinguished - Principal and agent, Corporation and principal officer.
**Absolute/Strict liability**
The rule in Rylands v. Fletcher, Liability for harm caused by inherently dangerous industries.

### Module : 3     Torts against persons and personal relations
Assault, battery, mayhem, False imprisonment, Defamation - libel, slander including law relating to privileges, Marital relations, domestic relations, parental relations, master and servant relations, Malicious prosecution, Shortened expectation of life, Nervous shock.
**Wrongs affecting property**
Trespass to land, trespass ab initio, dispossession, movable property- trespass to goods, detinue, conversion, Torts against business interests- injurious falsehood, misstatements, passing off.

### Module : 4     Negligence
Basic concepts, Theories of negligence, Standards of care, duty to take care, carelessness, inadvertence, Doctrine of contributory negligence, Res ipsa loquitor and its importance in contemporary

law, Liability due to negligence : different professionals, Liability of common carriers for negligence.
**Nuisance**
Definition, essentials and types, Acts which constitute nuisance obstructions of highway, pollution of air, water, noise, and interference with light and air.

## Module : 5     Legal remedies

Legal remedies, Award of damages - simple, special, punitive, Remoteness of damage - foresee ability and directness, Injunction, Specific restriction of property, Extra-legal remedies - self help, re-entry on land, re-caption of goods, distress damage feasant and abetment of nuisance.

**Motor Vehicle Act 1988** as amended up to date and rules under the Act.

**Leading Cases:**
- Ushaben v. Bhagya Laxmi Chitra Mandir. AIR 1970. GUJ. 18.
- Municipal Corpn. of Delhi v. Subhagwanti AIR 1966. S.C.page 1750.0
- Rylands v. Fletcher (1869) IR HT 330.
- Union Carbide Corporation v. Union of India, AIR 1992 SC248
- M.C. Mehta v. Union of India, AIR 1987 SC 965

**Select Bibliography:**
- Salmond and Heuston - On the Law of Torts (2000) Universal, Delhi.
- D.D. Basu, The Law of Torts (1982), Kamal, Calcutta.
- B.M. Gandhi, Law of Tort (1987), Eastern, Lucknow
- P.S. Achuthan Pillai, The law of Tort (1994) Eastern, Lucknow.
- Ratanlal & Dhirajlal, The Law of Torts (1997), Universal, Delhi.
- Jai Narayan Pandey- Law of Torts
- R.K. Bangia- Law of Torts
- N.M. Shukla- Law of Torts
- A.K. Dixit Law of Torts & Consumer Protection

## Paper 3.5 PUBLIC INTERNATIONAL LAW-I

| | |
|---|---|
| **Teaching Hrs. : L-04** | **Exam Hrs. – 3** |
| **Total : 100** | **Marks : Internal 30 External 70** |

**Module : 1**

Definition, Historical developments, Nature and Basis of International Law, Weaknesses of International Law.

**Module : 2**

Relation between International Law and State Law, States Kinds of States and Non-State entities, Acquisition and loss of State Territory

**Module : 3**

Territorial water, Continental Shelf, Continuous zone and exclusive economic zone, Diplomatic agents, Classification and Functions of diplomatic agents, Privileges and Immunities of diplomatic agents with reference to Vienna Convention on Diplomatic Relation, 1961.

**Module : 4**

Treaties : Definition, Basis, classification and formation of treaties. Interpretation and revision of treaties, principles of jus cogens and pacta sunt survenda, termination of treaties. Vienna Convention on the Law of Treaties. Pacific and compulsive means of settlement of international disputes.

**Module : 5**

War: Its legal character and effects, Enemy character, Armed conflicts and other hostile relations, belligerent Occupation, War Crimes, termination of war and doctrine of postliminium, Prize courts, Genocide

**Leading Cases:**
- United Kingdom v. Norway (Anglo Norwegian fisheries case) ICJ Report 1951 p. 116

- The Nuremberg judgment, International Military Tribunal, Nuremberg 1946 AJIL Vol. 41, 1947 p. 172
- In Re Government of India and Mubarak Ali Ahmad 1952 1 II Er 2060
- Khutch Tribunal award case- foreign affairs report volume XVII March 68.
- Right to passage over Indian territory case ICJ Report 1957 p. 125

**Select Bibliography:**
- Stark- An introduction to International Law
- Oppenheim- International Law Vol. I and II
- Antonio Cassese- International Law
- Breirly- The Law of Nations
- Nartin Dixon- Textbook on International Law
- Dr. H.O. Agarwal- International Law and Human Rights
- S.K. Kapoor- International Law, Human Rights

## Paper 3.6 Labour and Industrial Law-I

**Teaching Hrs. : L-04**                                 **Exam Hrs. – 3**

**Total : 100**                      **Marks : Internal 30 External 70**

### Module : 1

Historical perspective of labour:

(i)  Labour through the ages: slave Labour- guild system division on caste basis labour during feudal days.

(ii) Labour Capital Conflicts: Exploitation & Labour profit motive, poor bargaining power, poor   working condition, unorganized labour bonded labour, surplus, labour division of labour.

(iii) Transition from exploitation to protection and from status to contract.

### Module : 2

Industrial Dispute Act- Scope and Object definitions, assistance to bipartite settlement, work committee, conciliation officer, authorities for saving disputes, reference power.  Provision Relating to Lay-off,

### Module : 3      Trade Unionism:

Trade Union Freedoms: International perspective, The history of trade union movement in India, Right to trade union as part of human right, freedom of association- international norms and the Indian constitution The Trade Union Act, 1926: definitions, registration of trade union, functions of registrar, cancellation of registration and incorporation of registered trade unions. Funds- political and general, rights and liabilities of registered trade

union, immunities, office bearers, change of name, amalgamation and dissolution of trade union, penalties.

### Module : 4

Complete Factories Act, 1948- Definitions, inspectors, provisions regarding health, safety, welfare, provision relating to employment of young person, women workers, Annual leave with wages & Penealities.

### Module : 5

Protection of the Weaker Sections of Labour- Tribal labour: need for regulation, unorganized labour like domestic servants- problems and perspectives, bonded labour, (Regulation & Abolition Act, 1970), Child Labour Prohibition Act, 1986

**Leading Cases:**
- Workmen of Indian Standard Institutions v. Indian Standard Institution AIR 1976 SC 145.
- Burmah Shell Co v. Burmah Shell Management Staff Association1970 I FLL J. 590 SC, AIR 1971 SC 922.
- Workmen of firestone Tyre and Rubber Co. Ltd. v. The Management of Firestone Tyre and Rubber Co. Ltd. AIR 1972 SC 1227.
- Delhi Cloth and General Mills Co Ltd v. Ludh Budh Singh AIR 1972 SC 1031
- Jay Engineering Works v. State of West Bengal, AIR 1990 Cal 406
- Bidi Leaves and Tobacco Merchants Association India and other v. State of Bombay AIR 1962 SC 486
- Bangalore Water Suppy v. A. Rajappa AIR 1978 SC 548
- Express Newspapers Ltd v. Union of India AIR 1958 SC 578

**Select Bibliography:**
- O.P. Malhotra: Law of Industrial Disputes

- S.C. Srivastava: Social Security and labour laws
- V.V. Giri: Labour problems in Indian industry
- R.C. Saxena: Labour problems and social welfare
- S.N. Mishra: Labour and Industrial Laws
- Anil Sachdeva: Industrial and Labour Laws
- K.N. Pillai: Labour and Industrial Laws
- Ganga Sahai Sharma: Shram Vidhi
- N.D. Sharma : Shram Vidhi
- Gopi Krishan Arora : Shram Vidhi

# B.A. LL.B. 5 YEAR INTEGRATED
(HONOURS COURSE FOR SESSION 2022-23)
2nd Year (Semester – IV)
Paper 4.1 Computer – II

**Teaching Hrs. : L-04**                                                    **Exam Hrs. – 3**
**Total : 100**                                          **Marks : Internal 30 External 70**


### Module : 1     Database Management System
Data, Data Processing, Merits and demerits of file organisation. Database Overview, Purpose of the Database system, File systems Vs. Database Systems, View of Data: Data Abstraction, Instances, Schema, Data Models: Overview of Network, Hierarchical, and Relational Model, Database Architecture and Administrators, Codd's Rules.

### Module : 2
ER Model: Basic Terminology, Entity, Entity sets, attributes and keys, Relation and Relationship sets, Entity-Relationship Diagram, Weak and Strong entity types, Features of E-R Model, Specialization, Generalization Aggregation, Creating table from ER diagram. Basic Concept of Normalization up to BCNF.

### Module : 3
Implement Database concepts using Access, Creating Tables, Data Types, Entering Data, Table Design, Indexing, Importing Data, Operators and expressions, expression builder, various functions of Access, Import and Export Table, Creating Queries, Setting Relationship between Tables, Creating Forms, Controls and components of form, Master table and transaction table. Join property, various join options available in access, Creating & Printing Reports.

### Module : 4
Query Languages: DDL, DML, DCL, Introduction to SQL, Data Types, Basic SQL commands like Create, Alter, Drop, Truncate, Insert, Update, Delete etc, Basic SQL Queries, Union, Intersect and Except, Nested Queries.

### Module : 5
Transaction management and Concurrency control, Transaction management: ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks),Time stamping methods, optimistic methods, database recovery management.

**Select Bibliography:**
- Database Management System By A. Silberschatz, Henry F.Korth, S. Sudershan (McGraw- Hill)
- An Introduction to Database System By C.J. Date (Addision Wesley)
- Fundamentals of DBMS By Gupta, Dhillon, Magho, Sharma (Lakhanpal Publishers)
- Teach yourself Access. Sieglel, BPB
- Introduction to Computer Data Processing and System Analysis By V K Kapoor (Sultan Chand and Sons)

### Paper 4.2  History – III
### MODERN INDIAN HISTORY (1740-1956A.D.)

**Teaching Hrs. : L-04**                                                    **Exam Hrs. – 3**
**Total : 100**                                           **Marks : Internal 30 External 70**

## Module : 1
Political and Economic Condition of India at the advent of Europeans; British Expansion in Bengal - Battle of Plassey and Buxer; Administrative changes during 1772-73 AD; Emergence of Regional powers - Mysore, Punjab and Awadh : their struggle with British and annexation in the British Empire in the British Empire.

## Module : 2
Third Battle of Panipat and its consequences; Marathas under Mahadaji Sindhia and Nana Phadnavis; Maratha struggle with British Power; Causes of the failure of the Marathas.

## Module : 3
Uprising of 1857 : Causes, Nature, Failure and Consequences; Growth of British paramountcy in the Princely states-1858-1947 A.D. Main features of Permanent settlement, Raiyyatwari and Mahalwari revenue settlements and their impact on Peasantry; Growth of English Education and Press.

## Module : 4
Economic Impact of British Rule; Drain of wealth and its consequences; Causes of the emergence of Indian Nationalism : Role of Moderates and Extremists; Salient features of Government of India Act of 1919 and 1935 A.D.

## Module : 5
India's struggle for Freedom from 1920 to 1947 A.D.; Growth of Communal Politics; Factors Leading to Partition of India; Main features of the Indian Constitution of 1950 A.D.: Problems and Process of the Integration of Princely States into Indian Union (1947-49 A.D.); Reorganization of Indian states in 1956 A.D.

**Select Bibliography:**
- Bisheswar Prasad: Bondage and freedom.
- G.S.Sardesai : New History of the Marathas.Vol.III (also in Hindi)
- Sumit Sarkar : Modern Indian 1885 to 1947.
- Bipin Chandra: Modern India.
- A.R. Desai: Social Background of Indian Nationalism.
- B.N. Pandey (ed.): Centenary History of the Indian National Congress (1885-1985) Vikas Publishing House. New Delhi 1985.
- Tara Chand : History of freedom Movement in India, 4 vols Publication Division, New Delhi.
- M.S.Jain : Adhunik Bharat ka Itihas (Hindi)
- Bipin Chandra : Bharat ka Swatantrata Sangram (Hindi)
- B.N. Lunia : Adhunik Bharat ka Rajnitik Awam Sanskritik Itihas (Hindi)
- S.N. Paul : Growth of English Press in India.

## Paper 4.3 Political Science III
### (State Politics in India)

Teaching Hrs. : L-04                      Exam Hrs. – 3
Total : 100                           Marks : Internal 30 External 70

## Module : 1
Background : Trends in the growth of Nationalism and Democracy in British India and Princely states; integration of Princely States and Emergence of Modern Rajasthan, Princes in Rajasthan Politics;

Linguistic States Structure - Organization and aftermath.

## Module : 2
Constitutional Framework, Governance of States: office of the Governor- Mode of Appointment, Powers and functions; Role of Governor in State politics and Constitutional position. The office of the Chief minister-powers and functions and emerging role in state politics, The Council of Ministers in State Politics; The State legislature- Its organization, functions and emerging role in State Politics.

## Module : 3
Defections and State politics in India with special reference to the study of the Politics of defections in Haryana, Rajasthan and Bihar. Coalition Politics in the Indian States with reference to the study of the

working of coalition government in Kerala, West Bengal and Uttar Pradesh.   Role of regional political parties in India with reference to the study of the Akali Dal, the Telugu Desham and AIADMK.

## Module : 4

Political Parties and general elections: The pattern of party alliances : gains and short fall in general elections; Political Parties in Rajasthan; Electoral politics and Political Developments in Rajasthan. Role of Opposition in Rajasthan Vidhan Sabha; Pattern of leadership in States.

## Module : 5

Determinants of State Politics; Major Pressure Groups in India with special reference to Trade Unions and Chambers of Commerce; Public Opinion in India; Role of Caste, Region and language in State Politics.

**Select Bibliography:**

- B. L. Pangariya : State Politics In India
- Hardgrave : The Dravidian Movement
- I.N. Tewari : State Politics In India
- Iqubal Narain (Ed) : State Politics In India
- K.L. Kamal : Spotlight on Rajasthan Politics
- Myron Weiner (Ed) : State Politics In India
- Myron Weiner and John Os Good Field (Eds) : Electoral Politics In The Indian States
- Paul Brass : Functional Politics In An Indian State
- Paul Wallace and Surendra Chopra (Ed) : Political Dynamics of Punjab (4 Vol)
- Richard Sission : The Congress Party In Rajasthan : Political Integration and Institution Building In An Indian State
- Subhas Kashyap : The Politics of Defection : A Study of State Politics In India
- Sudha Pai : State Politics - New Dimensions
- V.P.Menon : The Story of Integration of Indian States
- H.M.Jain : State Governments
- A.R.Desai : Social Background of Indian Nationalism
- C.H.Philips (Ed) : Politics and Society In India
- Ramkrishan Nair : How The Communists Came To Power In Kerala
- M.A.Jhangian : Jana Sangh and Swatantra
- E.M.S.Nambodripad : The National Question In Kerala
- L.P.Sinha : The Left In India

## Paper 4.4 ENVIRONMENTAL LAW

Teaching Hrs. : L-04                                                        Exam Hrs. – 3
Total : 100                                                     Marks : Internal 30 External 70

## Module : 1

**Concept of Environment and Pollution -** Meaning and contents of environment, Meaning and contents of pollution, Kinds of pollution, Effects of pollution **Legal Control : Historical Perspective -** Indian tradition : Dharma of environment, British Raj - Industrial development and exploitation of nature Nuisance - Penal code and procedural codes Environmental Concerns in Modern India.

## Module : 2

**Constitutional Protection to environment -** Constitution making - development and property oriented approach Fundamental Rights and Environment - Rights to clean and healthy environment, environment V/s development. Directive principles of state policy and environment Fundamental Duties and environment . Other provisions of the constitution relevant to environment Emerging Principles - polluter pays, precautionary principle, public trust doctrine, sustainable development. Public Interest Litigation Judicial, Activism Pertaining to Environmental Pollution.

## Module : 3

**The Water (Prevention and Control of Pollution) Act, 1974:** Application of the Act, Definitions Constitution of central, state and joint boards Powers and functions of the Board, Qualification and

MGSU BIKANER                                                                [20}

disqualification of the members Prevention and control of water pollution and procedure thereof , Funds, account and audit Penalties

**The Air (Prevention and Control of pollution) Act, 1981:** Application of the Act, Definitions Constitutions of central, State and joint boards Powers and functions of the Board, Qualifications and disqualifications of the members Prevention and control of Air pollution and procedure thereof, Funds, account and audit Penalties.

## Module : 4

**Environment Protection Act, 1986:** Application of the Act, Definitions, General Powers of the central government including the powers to give directions Prevention and control of environmental pollutions and procedure thereof Penalties.

**Noise Pollution:** Meaning of Noise pollution, Sources of Noise pollution, Effects of Noise pollution, Legal Control.

## Module : 5    Forests and wild life protection

**The Indian Forests Act, 1927:** Salient features of the Act, Applicability, Power to reserve forests, power to declare forests land, powers and functions of forest settlement officer, protected forests, penalties and contraventions.

**The Forest (conservation) Act, 1980:** Objectives, application and salient features of the Act, definitions, Restrictions on the de-reservation of forests, advisory committee, offences and penalties.

**Wild life (Protection) Act, 1972:** Objectives, applicability and salient features of the Act, Authorities, Duties of wild life Advisory Board, Hunting of wild animals, sanctuaries, National Park, Closed areas, central Zoo authority, Trade or commerce in wild animals, Animal articles and trophies, Prevention and detection of offences, penalties.

**International Regime** UN declaration on right to development, Stockholm, Rio etc. conferences. Green House effect and Ozone depletion Bio-diversity.

**Leading Cases:**
- M.C. Mehta v. Union of India, AIR 1987 SC 965
- M.C. Mehta v. Union of India, AIR 1988 SC 1115
- Vellore citizen's welfare forum v. Union of India, AIR 1996 SC 2715
- Tarun Bharat Sangh, Alwar v.Union of India, AIR 1992 SC514
- A.P. Pollution control Board (II) v.Prof. M.V. Nayudu, (2001) 2 SCC 62.

**Select Bibliography**
- Aarmin Rosencraz, Environmental Law and policy in India, Oxford.
- R.B. Singh & Suresh Mishra, Environmental Law in India,Concept Publishing Co., New Delhi.
- Kailash Thakur, Environmental Protection Law and policy in India, Deep & Deep publications, New Delhi.

- Leela Krishan, P, Law and Environment, Eastern, Lucknow
- S.C. Shastri, Environmental Law, Eastern, Lucknow
- S. Shantha Kumar, Introduction to Environmental Law, Wadhwa,Nagpur

## Paper 4.5  Public International Law – II

**Teaching Hrs. : L-04**                                        **Exam Hrs. – 3**
**Total : 100**                                        **Marks : Internal 30 External 70**

### Module : 1
Sources of International Law, Subjects of International Law, Place of individual in International Law

### Module : 2
Nationality, Extradition and Asylum

### Module : 3
Recognition of States and Governments, Recognition of Insurgency and belligerency, de facto and de jure recognition, State succession, state Jurisdiction, state Responsibility, Intervention

### Module : 4

**International Institution :** League of Nations, United Nations. History and formation of United Nations, Organs of United Nations with specific reference to General Assembly, Security Council and International Court of Justice, New International Economic, Order Secretariat, International Criminal Court.

## Module : 5

The law of Neutrality-Basis of neutrality, Rights and duties of neutral state and belligerent States. Quasi neutrality and U.N. Charter. Right of Angary, Contraband, Blockade, unneutral Service, Right of Visit and Search, Disarmament

**Select Bibliography:**

- Stark J.G.: An introduction to International Law
- Oppenheim: International Law Vol. I and II
- Grotious : Modern International Law
- Breirly: The Law of Nations
- Nartin Dixon: Textbook on International Law
- Dr. H.O. Agarwal: International Law and Human Rights
- S.K. Kapoor: International Law, Human Rights (English and Hindi)
- Gaur, Atula, Protection & Implementation of International Human Rights in Domestic Law serials, Publication New Delhi.

## Paper 4.6   Labour & Industrial Law – II

**Teaching Hrs. : L-04**                                      **Exam Hrs. – 3**

**Total : 100**                                      **Marks   :   Internal   30 External 70**

## Module : 1

**State regulation of industrial relations:** The Industrial Dispute Act, 1947: Strike and Lockout, Lay off and retrenchment, special provision relation of layoff, public utility services. Retrenchment and Closure transfer of undertakings, penalties', Change in condition of service during pendency of dispute, unfair labour practices

## Module : 2

Workmen's Compensation Act, 1923: Historical perspective, Constitutionality of the Act; Definitions, Compensation for workmen; commissions: Appointment, function and power; Jurisdiction of civil court, Registration of agreement; Appeals and Power of State Government to make rules.

## Module : 3

Employee' State Insurance Act, 1948 Preliminary, definitions, corporation, standing committee and Medical benefit council; Employee State Insurance fund and purpose for which expenses can be incurred from the fund. Contribution Inspection function and duties; Recovery of contribution; Benefits Adjudication of disputes and claims; penalties; Miscellaneous provision.

## Module : 4

Payment of Gratuity Act, 1972 Definition; payment of gratuity, forfeiture of gratuity, determination of the amount of gratuity, nomination, rights of the nominees; recovery of gratuity, appointment of inspectors and their powers; penalties, cognizance of offence; protection of action taken in good faith; protection of gratuity. Maternity Benefit Act, 1961 Definition, Maternity benefits; Right, obligations, Inspectors : appointment, power,, duties, penalties and Miscellaneous provision.

## Module : 5

**Remuneration for labour:** Theories of wages, concept of wages, components of wages, disparity in wages. The Minimum Wages Act, 1948: objects, definitions, fixation of minimum rates of wages, inspectors, payment of minimum rates of wages, overtime claims. Payment of Wages Act, 1936

**Leading Cases:**

- Workmen of Indian Standard Institutions v.Indian Standard Institution AIR 1976 SC 145.
- Burmah Shell Co v. Burmah Shell Management Staff Association1970 I FLL J. 590 SC, AIR 1971 SC 922.

- Workmen of firestone Tyre and Rubber Co. Ltd. v.The Management of Firestone Tyre and Rubber Co. Ltd.AIR 1972 SC 1227.
- Delhi Cloth and General Mills Co Ltd v. Ludh Budh Singh AIR 1972 SC 1031
- Jay Engineering Works v. State of West Bengal, AIR 1990 Cal 406
- Bidi Leaves and Tobacco Merchants Association India and other v. State of Bombay AIR 1962 SC 486
- Bangalore Water Suppy v. A. Rajappa AIR 1978 SC 548
- Express Newspapers Ltd v. Union of India AIR 1958 SC 578

**Select Bibliography:**
- O.P. Malhotra: Law of Industrial Disputes
- S.C. Srivastava: Social Security and labour laws
- V.V. Giri: Labour problems in Indian industry
- R.C. Saxena: Labour problems and social welfare
- S.N. Mishra: Labour and Industrial Laws
- Anil Sachdeva: Industrial and Labour Laws
- K.N. Pillai: Labour and Industrial Laws
- Ganga Sahai Sharma: Shram Vidhi
- N.D. Sharma : Shram Vidhi
- Gopi Krishan Arora : Shram Vidhi

# B.A. LL.B. 5 YEAR INTEGRATED
(HONOURS COURSE FOR SESSION 2023-24)
**3nd Year (Semester –V)**

**Paper – 5.1  Sociology - III**

Teaching Hrs. : L-04                                           Exam Hrs. – 3
Total : 100                                    Marks : Internal 30 External 70

**Module : 1     Social  Research and Social Survey**
Social  Research and Social Survey- Meaning, Nature, Stages and types.
**Module : 2**
Data, Forms and Sources. Hypothesis, Concept, type and Sources.
**Module : 3**
Sampling - Concept, type , importance and limitations. Case Study Method.

**Module : 4**
Techniques of Data Collection: Observation, Interview, Schedule & Questionnaire. Questionnaire Construction Unit V Tabular presentation of Data,  Bivariate  and Multivariate. Average : Mean, Mode, Medium.

**Select Bibliography:**
- Elehance D.N.: Principles of Statistics (Hindi & English Ed.)
- Goode & Hatt: Methods in Social Research.
- Jahoda & Others: Research Method in Social Relation.
- Moser, C.A.: Survey Method in Social Investigation (English & Hindi Ed.)
- P.V. Young. : Scientific Social Survey and Research (English & Hindi Ed.)

**Paper 5.2 Communication Skills in English**
Teaching Hrs. : L-04                                           Exam Hrs. – 3
Total : 100                                    Marks : Internal 30 External 70

**Module : 1**

Principles of Communication: Types of communication, personal space, Gesture and posture, Facial expression, language affecting behaviour, personal qualities. Nonverbal communication. Listening skills, Requisites of an effective Letter. Use of words, phrases, clauses and balanced sentences.

Business Letters: Formal and style; the heading, the data line Inside address, attention line, the opening, salutation, the body, the subject line, the message, the complementary closing signature, reference, initials, enclosure, notation, post script, spacing, continuation, page-punctuation style.

## Module : 2

Kinds of Business letters, planning the letter characteristics. Brevity, Completeness, tact and courtesy, routine request, requesting appointments, letters, responses to letters with sales potentials, refusal letters, claim letters, collection letters, mild and strong appeals.

## Module : 3

Sales letters, public relations, memos and other form of messages, informal and analytical reports, agenda and minutes of meetings, preparing classified advertisement, direct mail advertising, press release.

## Module : 4

Spoken communication: Telephone Techniques, interview applying for employment, grievances, handling complaints from customers, answering enquiries, preparation for giving talk information technology and the future uses of word processor telex and FAX.

## Module : 5

Letters for handling complex business situations e.g. transported goods held up at a check-post, conflicting views about taxability of the goods, asking extension of time for repayment of loan installment, asking an increase in the OD, limit sanctioned by the bank, replying to industrial customer who received goods not ordered for etc. (Assignments to be given on case situations), Management Communication, Time Management.

## Paper 5.3 PROPERTY LAW INCLUDING
## TRANSFER OF PROPERTY ACT AND EASEMENT ACT

**Teaching Hrs.: L-04**                                          **Exam Hrs. – 3**
**Total : 100**                                          **Marks : Internal 30 External 70**

### Module : 1

**Jurisprudential control of property:** Concept, meaning and kinds of property: Movable and immovable, tangible and intangible property. Intellectual property: Definition and Concept.
**Preliminary:** Definition, Essentials of Transfer, Competence of parties, subject matter of transfer, transfer to unborn child, registration of transfer, etc.
**General Rules of Transfer:** (a) Restrains of alienation absolute or partial, Restrains of free enjoyment, Covenants affecting enjoyment, divesting on insolvency, perpetuities, Future estates, Doctrine of acceleration. Accumulation of income, exceptions, Covenants and Transfer. General Rules of Transfer
(b) Conditional transfer : Condition precedent, condition subsequent; vested and contingent interest.

### Module : 2

Election, Priority of rights, Notice, Implied transfers by limited owners, transfer of property out of which maintenance claims have to be met, ownership by holding out, ownership by estoppels, feeding the grant by estoppels. Doctrine of Part performance (Ss. 35-53 A) Sale of immovable property (Ss. 54 to 57).

### Module : 3

Mortgage and Charge : Kinds of mortgage, Rights and liabilities of Mortgagor and mortgagee, Priority, marshalling, contribution and subrogation.

### Module : 4

Exchange, Lease, Gift, Actionable Claims.

### Module : 5

**Easements :** Indian Easements Act, 1882, Nature, Characteristics, Creation. Essentials of Easements, Imposition, Acquisition, Incidents, Disturbance, Extinction, Suspension and Revival of Easement, Riparian Rights, License, Difference between lease and license.
**Leading cases:**
- Smt. Shanta Bai v. State of Bombay & Others, AIR 1958 SC 532

- Rajender v. Santa Singh, AIR 1973 SC 2537
- Kreglinger v. New Patagonia Meat and Cold Storage Comp. Ltd (1914) AC 25
- Union of India Vs Sharda Mills Ltd, AIR 1973 SC 281
- Nathu Lal v Phool Chand, AIR 1970 SC 546
- Jumma Masjid v. Deviah AIR 1962 SC 847

**Select Bibliography:**
- Mulla: Transfer of Property Act
- S. Shah: Lectures on Transfer of Property
- Vepa P Sarathi: Law of Transfer of Property
- I.C. Saxena: Transfer of Property
- B.B. Mitra: Transfer of Property
- S.R. Bhansali and Sharma: Sampathi Antaran Adhiniyam
- J.N. Kulshrestha: Sampathi Antaran Adhiniyam
- S.N. Shukla: Sampathi Antaran Adhiniyam
- G.P. Tripathi: Sampathi Antaran Adhiniyam
- Dr. R.R. Gupta: Sampathi Antaran Adhiniyam and Sukhadhikar

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**Paper 5.4 COMPANY LAW**
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**Teaching Hrs. : L-04**                                    **Exam Hrs. – 3**
**Total : 100**                          **Marks : Internal 30 External 70**

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**Module : 1**
</div>

**General Introduction:-** Theories of corporate personality, creation and extinction of corporations. Corpoations, partnerships and other associations of persons, state corporations, government companies, small scale; cooperative, corporate and joint sectors. Holding and subsidiary companies. Public and private company.

**Law relating to Public and Private Companies:** Companies Act 2013 Need of company for development, Kinds of Company, formation, registration and incorporation of a company.

<div align="center">

**Module : 2**
</div>

**Memorandum of association-** various clauses, alteration there in- doctrine of ultra vires

**Articles of association-** binding force- alteration- its relation with memorandum of association-doctrine of constructive notice and indoor management and exceptions. Promoters-position-duties and liabilities.

<div align="center">

**Module : 3**
</div>

**Prospectus-** issue, contents, liability for misstatements, statement in lieu of prospectus

**Shares-** general principles of allotment, statutory restrictions, share certificate- its objects and effects, transfer of shares, procedure for transfer, issue of shares at premium and discount, depository receipts-dematerialized shares (DEMAT). Calls on shares, forfeiture and surrender of shares; lien on shares

**Share capital-** kinds, alteration and reduction of share capital, further issue of capital, conversion of loans and debentures into capital.

**Borrowing powers-** charges, mortgages, contract by companies, debenture- meaning, kinds and remedies available to debenture holders.

<div align="center">

**Module : 4**
</div>

**Directors-** position, appointment, qualification, vacation of office, removal, resignation, powers and duties of directors. Managing directors and other managerial personnel.

**Meetings:** kinds, procedure and voting.

**Audit and accounts.**

**Dividends:** payment, capitalization and profit.

**Protection of minority rights.**

**Protection of oppression and mismanagement:** who can apply? Powers of the court, company and the central government. Investigation of company affairs.

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**Reconstruction and amalgamation of company**

**Module : 5**
</div>

**Winding up of Company :** Winding up-types: By court-grounds-who can apply? Procedure-powers of liquidator-powers of court, consequences of winding up. Voluntary winding up by members and creditors, winding up subject to supervision of courts, payment of liabilities, winding up of unregistered company.

**Corporate liability:**

(i) Legal liability of companies- civil and criminal

(ii) Remedies against them civil, criminal and tortious- specific relief Act, writs.

**Leading Cases:**

- Aron Soloman v. Soloman and Co. (1897) AC 22
- Royal British Bank v. Turkund (1856) 119 ER 886
- Bell House Ltd v. City Wall Properties Ltd (1966) SC 2 QB 656
- Bajaj Auto Ltd v. N.K. Farodia & Others, AIR 1971 SC 321
- Tata Engg and Locomative Co Ltd v. State of Bihar AIR 1965 SC 40
- Seth Mohan Lal v. Grain Chambers Ltd AIR 1968 SC 772
- Vasudev Ram Chandra Shelat v. Pranlal Jaya Nand Thakur AIR 1974 SC 1728
- Shanti Prasad Jain v. Kalinga Tubes Ltd AIR 1965 SC 1535

**Select Bibliography:**

- Atiya: The companies act, 1956
- Avtar Singh: Company law (English and Hindi)
- L.C.B. Gower: Principles of Modern Company Law
- A. Ramaiya: Guide to the Companies Act
- R.R. Pennigton: Company Law
- S.M. Shah: Lectures on Company Law
- N.V. Paranjape- Company Law (amended upto date)

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**Paper 5.5 Constitutional Law – I**

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**Teaching Hrs.: L-04**                                              **Exam Hrs. – 3**
**Total : 100**                                          **Marks : Internal 30 External 70**

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**Module : 1**

</div>

**Introductory:** Making of Indian Constitution., Short Title, commencement of the constitution, authoratative text in the Hindi language, Nature and special features of the Indian Constitution. Challenges to Indian Federalism, Preamble, The Union & its terriotory Citizenship and state

**Fundamental Rights:** Concept of Fundamental Rights. Constitutional provisions relating to Fundamental rights. Articles 12 to 35

<div align="center">

**Module : 2**

</div>

**The Union Executive** The President Election, qualifications, salary and impeachment, Power: Legislative, Executive and dictionary power Constitutional provision. and Vice-President of India, Council of Ministers. Prime Minister- Cabinet system- Collective responsibility, Coalition Government.

**The Union Legislature** Lok Sabha, Rajya Sabha, Legislative process privileges of the parliament & state legislature, legislative privileges and fundamental rights.

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**Module : 3**

</div>

**Judiciary under the Indian Consitution : Judicial independence The Union and State Judiciary -** The Supreme Court and High Courts. Subordinate Judiciary Judges: appointment, Removal transfer and condition of services. Judicial review – nature and scope.

<div align="center">

**Module : 4**

</div>

**Services under the constitution -** Doctrine of Pleasure (Article 310), Protection against arbitrary dismissal, removal or reduction in rank (Article 311) and exceptions to Article 311., Public Service Commission of the Union and the states.

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**Module : 5**

</div>

**Emergency** Meaning and scope., National, State and Financial emergency. Proclamation of Emergency- conditions, effect of emergency on centre - state relations. Emergency and suspension of fundamental rights.

**Leading cases:**

- Keshvanand Bharti v. State of Kerala, AIR 1973 S.C.1461
- Maneka Gandhi v. Union of India, AIR 1978 S.C. 597.
- Indra Sawhney v. Union of India, AIR 1993, S.C. 477.
- S.R.Bommai v. Union of India, AIR 1994, S.C. 1918.
- Vishaka v. State of Rajasthan, AIR 1997, S.C. 3014.
- Minerva Miles Ltd. v. Union of India, AIR 1978 SC 1789

**Select Bibliography:**

- D.D. Basu, Introduction of the constitution of India, Prentice Hall of India, Delhi.
- H.M.Seervai, Constitution of India, Vol.1-3, Tripathi, Bombay.
- V.N.Shukla, Constitutional law of India, Oxford.
- G.Austin, Indian Constitution : Cornerstone of a Nation.
- M.P. Jain, Indian Constitutional Law, Wadhwa and Company, Nagpur.
- Kagzi, The Constitution of India, India Law House, N.Delhi.
- J.N.Pandey- Constitution of India (English)

## Paper 5.6 PROFESSIONAL ETHICS, LAWYER'S ACCOUNTABILITY AND BAR - BENCH RELATIONS.

**Teaching Hrs.: L-04**                                     **Exam Hrs. – 3**
**Total : 100**                           **Marks : Internal 30 External 70**

### Module : 1

**Basic Postulates of Administration of Justice:** Image of justice. Wheels of the chariot of justice. Bench-Judges in the image of justice. Bar-Act, Plead and Dress of Advocate.

**Historical Evolution of Legal Profession:** Legal Profession in Ancient India. Position of Legal Profession in Muslim Regime. Legal Profession during the British Regime.

**Autonomy of Legal Profession** Indian Bar Committee, 1923 , Indian Bar Council Act, 1926 , All India Bar Committee, 1951, Unified Bar - The necessity of time., 14th Report of the Law Commission., Advocates Act, 1961., Provisions which strengthen Unified Bar., Organization of Bar on All India Basis, Constitution of Bar Council and Elections., Admission and Disciplinary action., Regulation of Legal Education.

**Image/Position of Legal Profession in Society:** Advocacy is a profession not a business., Legal profession is a noble profession., Deterioration in Image of Legal Profession in Independent India. Role of Lawyers in Society.

### Module : 2

**The necessity of the Professional Ethics:** The Art of Advocacy, Professional Ethics. Nature of Professional Ethics and the problems of the code of Ethics. Advantages of having codified professional ethics. Professional Ethics - Rules of Conducts.

**Bar-Bench Relationship:** General Conception., Advocates duty to the Court., Duty of Judge towards the Advocate. , Duty of the Bar towards the Bench. Grounds of disputes in Bar-Bench Relations. Suggestions to improve Bar-Bench Relations.

### Module : 3

**Relationship between an Advocate and his client:** Code of conduct, Lawyersclient Relationship. Do's and Don'ts for advocate towards client.

**Accountability of lawyers.**

**Professional Ethics and Advocates Duties to colleagues and others**

Advocates duty to colleagues, Advocates duty to opponents. Advocates duty towards witnesses. Advocates duty to public. Illustrations of other misconduct. Disciplinary committee's approach in case of professional or other Misconduct.

### Module : 4      Contempt of Court Act 1971

MGSU BIKANER                                                          [27}

Purpose and meaning of contempt of court., Contempt of Court by Judge, lawyers and state., Contempt by Judge, Magistrate or other persons acting judicially. Contempt of Court by Advocates. Contempt of Court by State, Corporate bodies and their officers.

## Module : 5

Punishment: Nature and Extent. Power of Superior Courts in Contempt cases. Safeguards available in contempt cases.

**Authorities and Procedures to deal with professional , misconduct and remedies against their order.**

State Bar Council and its disciplinary committee.

The Bar Council of India and its disciplinary committee.

Remedies against the order of punishment.

Quantum of punishment.

**Leading Cases:**

- In Re Vinay Chandra Mishra.
- Hikmat Ali Khan v. Ishwar Prasad Arya & others 1997,3SCC 1608
- P.D. Gupta v. Ram Murti and another. 7 S.C.C. 147 AIR 1998 S.C.283.
- D.S. Dalal v. State Bank of India and others. AIR 1993 S.C. 1608.
- Delhi Judicial Services Association, Tis Hazari Court v. State of Gujrat, AIR 1991 S.C. 2176.

**Select Bibliography**

- The Bar Council Code of Ethics.
- The contempt of Court Act.
- Dr.Anirudh Prasad, Principles of the Ethics of Legal Profession in India.
- Mamta Rao, Professional Ethics.
- Raju Ramachandran, Professional Ethics : Changing profession, changing ethics, Butter worths, New Delhi.
- Dr. Murlidhar Chaturvedi- Proffessional Ethics, Accountabiligy of Lawyers and bench

# B.A. LL.B. 5 YEAR INTEGRATED
## (HONOURS COURSE FOR SESSION 2023-24)
### 3nd Year (Semester –VI)

### Paper 6.1  Economic-III
### MONEY, BANKING AND PUBLIC FINANCE

**Teaching Hrs.: L-04**                                                   **Exam Hrs. – 3**

**Total : 100**                                          **Marks  :  Internal  30 External 70**

## Module : 1

Value of Money and Inflation Money-concept and Importance, quantity theory of money, cash transaction and cash balance approaches; The Keynesian approach, Inflation, deflation and reflection, definition, types. causes and effects of inflation on different sectors of the economy; Demand pull and cost-push inflation; Measures to control inflation, Philips curve, Determinants of money supply - High powered money and money multiplier.

## Module : 2

Commercial Banking Meaning types and Functions of commercial banks. The process of credit Creation. Evolution of commercial banking in India after independence.  Recent reform in banking sector.

## Module : 3

Central Banking Functions of a central bank; quantitative and qualitative methods of credit Control- Bank rate policy, Open market operations, Variable reserve ratio and Selective methods, Role and functions of the Reserve Bank of India. Objectives and limitations of monetary policy with special reference to India.

## Module : 4

Nature and Scope of Public Finance  Meaning and scope of public finance; Distinction between private and public finance; Public goods; The principle of maximum social advantage; Public Expenditure- Meaning, classification and principle of public expenditure;  Canons and effects of public expenditure.

## Module : 5
Taxation and Public Debt Sources of public revenue; Taxation, canons and classification of taxes; Impact and incidence and shifting of taxes; Taxable capacity; Effects of taxation; Characteristics of a good tax system. Sources of public borrowing; Effects of  public debt. Various concepts of budget deficits.

**Select Bibliography:**

- Ackley, G. (1978), Macroeconomics: Theory and Policy, Macmillan Publishing Co., New York.
- Gupta, S.B. (1994), Monetary Economics, S. Chand & Co., New Delhi.
- Musgrave, R.A. and PB. Musgrave (1976), Public Finance in Theory and Practice, McGraw Hill, Kogakusha,
  Tvkyo.
- Shapiro, E. (1996), Macroeconomic Analysis, Galgotia Publications, New Delhi.
- S. Ganguly - Public Finance
- Tyagi B.P - Public Finance
- Bhatia H.L. - Public Finance
- Lekhi RK. - Public Finance
- Nathuramka L.N.- Money, Banking and Public Finance

## Paper 6.2  History – IV
## HISTORY OF RAJASTHAN HISTORY FROM EARLIEST TIMES TO 1956 A.D.
**Teaching Hrs. : L-04**                                                           **Exam Hrs. – 3**
**Total : 100**                                            **Marks : Internal 30 External 70**

## Module : 1
Main Sources of History of Rajasthan; An outline of Proto-Historic Rajasthan with special reference to Kalibanga, Ahar and Bairath; Outline of Matsya Janapad; Origin of Rajputs; Prithvi Raj Chauhan-III and his achievements.

## Module : 2
The Policy of Collaboration and Resistance of the Rajput States with special reference to Hammir, Maharana Sanga, Maldeo, Maharana Pratap, Man Singh, Rai Singh of Bikaner, Jaswant Singh and Sawai Jai Singh.

## Module : 3
Causes and Results of Maratha penetration in Rajputana; Circumstances and consequences of the treaties of 1818 A.D. signed with Britishers with special reference to Mewar,Marwar and Kota; War of Independence of 1857 A.D. in Rajasthan–Causes and results; Causes of political awakening in Rajasthan.

## Module : 4
Peasant Movement in Bijolia; Tribal Movement under Govindgiri and Motilal Tejawat; Contribution of Prajamandals in the Freedom Movement with special reference to Bikaner, Jaipur and Marwar; Formation of Rajasthan in 1948-1956 A.D.

## Module : 5
Characteristics of Feudalism in Rajput States; Changes in the position of the Rajput Nobility under British Paramountcy, Fort and Temple Architecture of Rajasthan; Rajasthani Art and Literature.

**Select Bibliography:**

- D.C.Shukla : Early History of Rajasthan
- Dashrath Sharma : Rajasthan Through the Ages.Vol.-I,Rajasthan State Archives, Bikaner.

- S.S. Saxena and Padmaja Sharma : Bijolia Kissan Andolan Ka Ithihas, Rajasthan State Archives Bikaner, 1972.
- V.P.Menon : Integration of the Indian State.

**Teaching Hrs. : L-04**                                        **Exam Hrs. – 3**
**Total : 100**                              **Marks    :    Internal    30**
**External 70**

## Module : 1

**Introduction -** Sources, Schools and application, Religious and Charitable Endowment - Essentials of an Endowment, Kinds, Shebait and Mahant. **Joint Family**- Mitakshara joint family, Mitakshara coparcenary-formation and incidents, Property under Mitakshara law - separate property and coparcenary property, Dayabhaga coparcenary - formation and incidents, Property under Dayabhaga law, Karta of the joint family - his position, powers, privileges and obligations, Alienation of property - separate and coparcenary, Debts - doctrines of pious obligations and antecedent debt, Partition and re-union, Joint Hindu family as a social security institution and impact of Hindu Gains of Learning Act and various tax laws on it, Matrilineal joint family.

## Module : 2      Customary practices and State regulation

**Hindu marriage Act, 1955:** Conditions of Hindu Marriage, its ceremonies and Registrations, Void and Voidable marriage, Polygamy, Concubinage, Child marriage, Restraint Act, 2007

**Matrimonial Remedies:** Restitution of conjugal Rights, Judicial Separation, Divorce Grounds,  (a) Customary dissolution of marriage, divorce by mutual consent
Nullity of marriage : Bar to matrimonial relief : Marriage Act 1955

## Module : 3      Inheritance

Historical perspective of traditional Hindu law as a background to the study of Hindu Succession Act, 1956

**The Hindu Succession Act, 1956 :** Definitions Succession to the property of a Hindu male. Succession to interest in coparcenary property, property of a Hindu female, Succession to the property of a Hindu female, General rules and disqualifications of succession, Escheat.

## Module : 4      Alimony and maintenance

Maintenance of neglected wives, divorced wives, minor children, disabled children, and parents who are unable to support themselves; provisions under the code of Criminal Procedure, 1973, Alimony and maintenance as an independent remedy: a review under personal law, need for reforming the law, Alimony and maintenance as an ancillary relief, Legitimacy. Welfare of the child principle.

**The Hindu Adoption and Maintenance Act, 1956 :** Requisites of valid adoption, Capacity to take in adoption, capacity to give 'in' adoption, persons who may be adopted, other conditions for a valid adoption. Effects of adoption, Miscellaneous provision of adoption.

**Maintenance** of wife, children and parents, Maintenance of widowed daughter- in law, Dependents and their maintenance. Amount of maintenance, Miscellaneous provisions of maintenance.

## Module : 5

**The Hindu Minority and Guardianship Act, 1956:** Natural guardians and their powers. Testamentary guardians and their powers, de facto guardian general provisions of guardianship.

**Partition:** Meaning, property for partition, persons entitled to claim partition and allotment of shares, partition how effected, Determination of Share, Reopening of partition. Re-union, Debts-Doctrine of pious obligation. Antecedent Debts.

**Establishment of Family Courts:** Constitution, power and functions, Administration of gender justice.

**Uniform Civil Code-need for:** Religious pluralism and its implications, Connotations of the directive contained in Article 44 of the Constitution, Impediments to the formulation of the Uniform Civil Code, The idea of Optional Uniform Civil Code.

**Leading Cases:**
- Shastri Yagna Purushdasji v. Muldas, AIR 1966 S.C. 1153.
- Hanooman Prasad v. Mussamat Babooee Mandraj Kunwaree (1856) 6 M.I.A. 305.

- Gita Hariharan v. Reserve Bank of India, AIR 1999 S.C. 1149.

- Bipin Chander v. Prabhavati, AIR 1957 S.C. 176.
- Dr.N.G. Dastane v. Sucheta Dastane, AIR 1975 S.C. 1534.
**Select Bibliography:**
- Mulla :  Hindu Law
- Paras Diwan, Law of Instestate and Testamentary Succession (1998), Universal.
- Basu, N.D., Law of Succession (2000), Universal.
- Kusem, Marriage and Divorce Law Manual (2000) Universal.
- Manchanda, S.C., Law and Practice of Divorce in India (2000) Universal.
- P.V.Kane, History of Dharmasastras Vol.2 pt.1 at 624-632 (1974).
- A.Kuppuswami (ed.) Mayne's Hindu Law and Usage Ch.4(1986).
- B.Sivaramayys, Inequalities and the Law, (1985).
- K.C.Daiya, "Population control through family planning in India, "Indian Journal of Legal Studies, 85
  (1979).
- J.D.M. Derrett, Hindu Law : Past and Present.
- J.D.M. Derrett, Dealth of Marriage Law.
- J.D.M. Derret, A Critique of Modern Hindu Law, (1970).
- Paras Diwan, Hindu Law (1985).
- S.T.Desai (ed.) Mulla's Principles of Hindu Law, (1998) - Butterworths-India.
- Paras Diwan, Family Law: Law of Marriage and Divorce in India, (1984).
- A.M.Bhattachargee, Hindu Law and the Constitution (1994) Eastern Law House, Calcutta.
- Paras Diwan, Law of Adoption, Ministry, Guardianship and Custody (2000), Universal.
- B.M. Gandhi.

## Paper 6.4 Family Law – II (Muslim Law)

**Teaching Hrs. : L-04**                                           **Exam Hrs. – 3**
**Total : 100**                                    **Marks : Internal 30 External 70**

### Module : 1

**Evolution and application of Law:** Origin, Development, Sources, Schools, Application, Interpretation, conversion

**Marriage:** Nature of marriage, Essentials of marriage, Khyar-ul-bulug, Iddat, Khilwat-us-sahih, Matrimonial Stipulations, Kinds of marriages, Effects of marriages.

### Module : 2

**Mahar (Dower):** Meaning, Nature, Kinds of Dower, Objects of Dower , Subject matter of Dower Wife's right on non-payment of dower.

**Dissolution of marriage:** Historical background, Talaq, Various kinds of Talaq Sec.2 of the Dissolution of Muslim Marriage Act, 1939., Legal Effect of Divorce.

### Module : 3

**Pre-emption (Haq Shufa):** Meaning. Nature of Pre-emption., Classification of Pre-emption, Essential formalities. Subject matter of pre-emption., Devices for evading pre-emption.

**Gift (Hiba):** Meaning , Requisites of valid gift., Gift of musha , Conditional and future gift. Life estate and life interest., Hiba-bil-ewaj , Hiba-ba-shart-ul-ewaj.

### Module : 4

**Will (Vasiyat):** Competency of testator and legatee., Valid subject of will., Testamentary limitation., Formalities of a will., Abatement of Legacy.

**Legitimacy and Acknowledgement:** Legitimacy and Legitimation., Presumption of Legitimacy under Sec.112 of the Indian Evidence Act. Conditions for valid acknowledgement.

**Maintenance** Meaning, Persons entitled to maintenance. Principles of maintenance. Maintenance of Divorced Muslim woman under the Muslim woman (Protection of Right on Divorce) Act 1986. Death Bed Transactions , Meaning of Marz-ul-maut.

### Module : 5

**Waqf:** Meaning of waqf., Essentials of waqf. Kinds of waqf, Beneficiaries of waqf. Formalities for creating waqf. , Waqf of musha. Administration of waqf. Mutawalli - Appointment, function, role, power, removal. The waqf validating Act, 1913. Takia, Khankah

**Inheritance:** General Principles of Law of inheritance., Classification of heirs under Hanafi and their shares and distribution of property.

**Leading cases:**
- Maina Bibi v. Choudhary Vakil Anmad (1925) 52 La.145.
- Habibur Rahman v. Altaf Ali (1921) 481. A.114.
- Monshee Bazul-ul-Raheem v. Luteefutoon - Nissa (1861) 8 MIA. 379.
- Abdul Fata v. Russmoy Chaudhary (1894) 2ZIA76.
- Mohd. Ahmad Khan v. Shah Bano Begum AIR 1985 S.C. 945.

**Select Bibliography:**
- Fyzee, Muhammedan Law.
- Mulla, Principles of Mohammedan Law.
- A.M. Bhattacharygee, Muslim Law and the constitution.
- Prof. B.L.Verma, Islamic law.
- Dr. D.S. Thalore, Muslim Law, UBH Jaipur
- Akil Ahamed - Muslim Law

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**Paper 6.5 Constitutional Law – II**

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**Teaching Hrs.: L-04**　　　　　　　　　　　　　　　　**Exam Hrs. – 3**
**Total : 100**　　　　　　　　　　　　　　　**Marks : Internal 30 External 70**

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**Module : 1**

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**Directive Principles and Fundamental Duties:** Directive Principles-directions for social change - A new social order. Interrelationship between fundamental rights and directive principles. Fundamental Duties – The need and status in constitutional set-up.

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**Module : 2**

</div>

**The State Executive:** The Governor, The Council of Ministers, Relationship between the Governor and the Council of Ministers.

**The State Legislature:** Vidhan Sabha, Vidhan Parishad. The Panchyats The Municiplaties.

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**Module : 3**

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**Union and State Relationship:**Legislative relationship, Administrative relationship Financial relationship.

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**Module : 4**

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State liability in contracts and  Torts. Suits by and against the state. Property Rights (Article 300-A).
**Freedom of Trade, Commerce and Intercourse**

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**Module : 5**

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**The Amendment of the Constitution:** Necessity of Amending provisions in the constitution. ; Procedure for Amendment. Amendments of fundamental rights. Judicial review of amendment and the theory of Basic Structure. Temporary provision with respect of the state of J& K Union of India, AIR 1978 SC  1789

**Select Bibliography:**
- D.D. Basu, Introduction of the constitution of India, Prentice Hall of India, Delhi.
- H.M.Seervai, Constitution of India, Vol.1-3, Tripathi, Bombay.
- V.N.Shukla, Constitutional law of India, Oxford.
- G.Austin, Indian Constitution : Cornerstone of a Nation.
- M.P. Jain, Indian Constitutional Law, Wadhwa and Company, Nagpur.
- Kagzi, The Constitution of India, India Law House, N.Delhi.
- J.N.Pandey- Constitution of India (English)

Teaching Hrs. : L-04                                                        Exam Hrs. – 3
Total : 100                                              Marks : Internal 30 External 70

## Module : 1

**Introduction:** PIL- its origin and meaning Scope and nature of PIL Object of PIL PIL and Private Interest Litigation

**Locus Standi:** Principle of locus standi- traditional approach Liberal approach Guidelines for entertaining a PIL Petition by public spirited person or association Misuse of PIL.

## Module : 2

**PIL and enforcement of Fundamental Rights** General Compensation for breach of fundamental rights Compensation for illegal detention Compensation to victim of police atrocities. PIL as a redress to custodial violence cases. PIL and Environmental Law

## Module : 3

**Pollution- a curse to mankind.**
Pollution free environment as a fundamental right. Enforcement of environmental laws through filing PIL.

**PIL for the enforcement of the rights of weaker sections of the society**
For the enforcement of the rights of women. For the enforcement of the rights of children. For the enforcement of the rights of bonded labour.

## Module : 4

**Legal Aid :** Meaning, Nature, Scope, and Development Constitutional provisions ; Provision of civil procedure code and code of criminal procedure regarding legal aid The Legal Services Authorities Act and legal

**Drafting of PIL petitions and writing of applications for legal aid**

## Module : 5

**The Legal Services Authorities Act, 1987 (as amended by the Act of 2002)**
The national legal services authority- constitution and functions State legal services authority- constitution and functions District legal services authority, Taluk legal services committee- constitution and functions
Lok Adalat- organization, cognizances of cases, award and powers. Lre litigation, conciliation and settlement Permanent lok adalat- establishment, cognizance of cases, procedure and award
        The Rajasthan State Legal Services Authority Regulations,1999- Legal literacy, legal awareness committee: Constitution and functions of High Court and District Legal awareness committee
Organization of legal awareness camps by law schools
Role of voluntary organizations
**Leading Cases:**
- Bandhua Mukti Morcha v. Union of India AIR 1984 SC 802, (1984) 3 SCC 161
- Olga Tellis v. Bombay Municipal Corporation (1985) 3 SCC 545, AIR 1986 SC 180
- Sukdas v. Union Territory of Arunachal Pradesh (1986) 2 SCC 401, AIR 1986 SC 991
- Sheela Barse v. State of Maharashtra AIR 1983 SC 378
**Select Bibliography**
- Dr. S.R. Myneni- Public Interest lawyering legal aid and para legal services
- Sujan Singh- Legal aid-human right to equality
- S.S. Sharma- legal assistance to Poor
- P.N. Bhagwati- legal aid as human right
- P.N. Bajpayee- Legal aid and the Bar council
- Sunil Deshtra- lok adalats in India- genesis and functioning
- Sampat Jain- Public Interst Litigation
- Dr. Kailash Rai- Janhit Vakalat, vidhik sahyog evam ardh vidhik sevayen.
- Suresh Bhatia- Nirdhan Vidhik Shayta, Rajasthan Hindi Granth Academy
- P.M. Bakshi- Public Interest Litigation

# B.A. LL.B. 5 YEAR INTEGRATED
## (HONOURS COURSE FOR SESSION 2024-25)
### 4th Year (Semester –VII)

### Paper 7.1 Political Science – IV

Teaching Hrs. : L-04             Exam Hrs. – 3

Total : 100             Marks : Internal 30 External 70

#### Module : 1

Major Landmarks in the Constitutional Development of India, Framing of the Indian Constitution-Major Issues, Trends and Approaches of the Constituent Assembly; Preamble of the Constitution; Salient features of the Indian Constitution.

#### Module : 2

Human Rights Philosophy in Indian Constitution; Fundamental Rights and Directive Principles of State Policy, Methods of Amendment of Constitution; Nature of the Federal System, Union-State Relationship and recent trends.

#### Module : 3

The Union Executive; The Union Parliament, Working of Parliamentary System, The Supreme Court; The Judicial Review; Emergency Provisions.

#### Module : 4

Office of the Governor, Chief Minister and High Courts, Role of Leadership, Coalition Govt., Party System, Election Commission, Electoral Politics and Electoral Reforms.

#### Module : 5

National Integration: Major problems facing Indian Political System- Terrorism, Linguism, Regionalism, Communalism, Politics of Reservation; Role of Caste in Indian Politics.

### Paper 7.2 Administrative Law

Teaching Hrs.: L-04             Exam Hrs. – 3

Total : 100             Marks : Internal 30 External 70

#### Module : 1

**Evolution, nature and scope of Administrative Law-** from a laissez faire to a social welfare state, evolution of administration as the fourth branch of government, conseil'detate, definition and scope of Administrative Law, relationship between Constitutional Law and Administrative Law, separation of powers and rule of law.

**Civil services in India:** Nature and organization of civil services:

#### Module : 2

**Delegated Legislation:** Necessity constitutionality of delegated legislation- and its limitations, powers of exclusion, inclusion and power to modify statute, procedure, Legislative and judicial control of delegated legislation, sub-delegation of legislative powers.

#### Module : 3

**Judicial powers of administration:**

(i) Administrative tribunals-need, nature, constitution, jurisdiction and procedure. Distinction between quasi-judicial and administrative functions.

(ii) Principles of natural justice- the right to hearing- essential of hearing process, noman shall be judge in his own cause, no man shall be condemned unheard, reasoned decisions, the right to counsel.

#### Module : 4

**Judicial control of administrative action:** grounds-jurisdictional error, ultravires, abuse and non exercise of jurisdiction, error apparent on the face of record, violation of principles of natural justice, violation of public policy, unreasonableness and legitimate expectation. Remedies in judicial review, writs, declaratory judgments and injunctions, specific performance and civil suits for compensation.

**Administrative discretion:** Need for administrative discretion, administrative discretion and rule of law, limitations on exercise of discretion-malafide exercise of discretion, constitutional imperative and use of discretionary authority.

## Module : 5

**Contractual and tortious liability of state:** Tortious liability, sovereign and non sovereign functions, statutory immunity, act of state, contractual liability of government, government privilege in legal proceedings-state secrets, public interest, transparency and right to information.

**Corporation and Public undertakings:** State monopoly, liability of public and private corporations- departmental undertakings, legislative and governmental control, legal remedies, accountability- committee on public undertakings, estimate committee.

**Public inquiries and commission inquiry, ombudsman:** lokpal, lokayukta, vigilance commission, parliamentary committees.

**Leading cases:**
- A.K. Kraipak v. Union of India AIR 1970 SC 150
- In re Delhi Laws Act, AIR 1951 SC 332
- Raj Narayan v. Chairman, Patna Administration Committee Patna AIR 1954 SC 569
- Syed Yaqoob v. Radha Krishnan AIR 1964 SC 477
- Rohtash industries Pvt Ltd v. S.D. Agarwal AIR 1969 SC 707
- State of Karnataka v. Union of India AIR 1978 SC 68

**Select Bibliography:**
- M.C.J kagzi- The Indian Administrative Law
- I.P. Massey: Administrative Law
- D.D. Basu: Administrative Law
- M.A. Fazal: Judicial control of Administrative action in India, Pakistan and Bangladesh
- Wade: Administrative Law
- S.P. Sathe: Administrative Law
- U.P.D. Kesari: Prashasnic Vidhi
- Jain and Jain- Principles of Administrative Law
- J.J.R. Upadhayay- Prashasnic Vidhi

## Paper 7.3 Taxation Law

**Teaching Hrs. : L-04**                                      **Exam Hrs. – 3**
**Total : 100**                          **Marks : Internal 30 External 70**

### Module : 1

**Basic concept:** Assessment year, Previous year, Person, Assessee, Income , Agricultural Income, Casual Income, Capital Asset, Charitable purpose, Total Income, Gross Total Income, step system and slab system, Capital and Revenue, Avoidance of tax and tax evasion, Income tax authorities. Residential; status and Tax Incidence– Exemptions and deductions of Income.

**General Perspective:** History of tax law in India, fundamental  principles relating to tax laws, concept of tax, nature and characteristics of taxes, distinction between tax and fees, tax and Access, direct and indirect taxes, tax evasion and tax avoidance, scope of taxing powers of parliament, state legislature and local bodies.

### Module : 2

Income Tax Act, 1961, Income under the Head `Salaries' Income from House Property, Income of other
persons included in Assessee's Total income.

### Module : 3

Profits and Gains of Business or Profession, Depreciation allowance, Capital Gains, Income from other sources, Set off and carry forward of losses.

### Module : 4

Return of Income, Assessment and Re-assessment, Assessment of Firms and Partners and Penalties offences and prosecution under this Act, Appeal and revision.

### Module : 5

**Wealth Tax Act:** Valuation date, Net Wealth, Incidence of Tax, Assets, Assets exempted from Tax Return of Wealth, Assessment, Time limit for completion of assessment.

Key Features of Central Goods And Services Tax Act, 2017

**Leading Cases:**
- P. Krishana Menon v. CIT, AIR 1956 SC 75
- CIT West Bengal v. Benoy Kumar Saha Roya, AIR 1957 SC 761
- Mala Ram & Sons v. CIT AIR 1956 SC 367
- Pingle Industries Ltd v. CIT AIR 1960 SC 1934
- Banaras Cloth Dealers Syndicate v. Benaras 1964 ITR 50
- CIT v. Kothari (1963) 40 IITR 107 (SC)

**Select Bibliography:**
- Ramesh Sharma, Supreme Court on Direct taxes
- Kanga and Palkiwala, The Law and practice of Income Tax
- R.V. Patel, The Central Sales Tax Act
- S.D. Singh, Principles of Law of Sales Tax

- H.C. Malhotra, Aykar Vidhan Lekha
- Bhagwati Prasad, Aykar Vidhi
- S. Bhattacharya : Indian Income Tax Law and Practice.
- A.K. Saxena : Law on Income tax in India.

- Nathulal Jain : Ayakar Vidhi.
- Kailash Rai  : Ayakar Vidhi.

## Paper 7. 4 Law of Crimes (Indian Penal Code)

Teaching Hrs. : L-04　　　　　　　　　　　　　　　　Exam Hrs. – 3
Total : 100　　　　　　　　　　　　　　　Marks : Internal 30 External 70

### Module : 1

**General Introduction:** Concept of crime: Its definition, nature and scope. Distinction between crime and other wrongs. Applicability of IPC: Intra and Extra territorial operation. Salient features of the IPC, general explanations.

**Elements of criminal liability:** Mental elements in crime- mensrea (evil intention), its importance and exceptions. (Trends to fix liability without mensrea). State's power to determine acts or omissions as crime.

**Types of Punishment:** Death punishment, its impacts and social relevance. Alternative to capital punishment; imprisonment for life with hard labour, simple imprisonment; Forfeiture of property and fine. Discretion of Court in awarding punishment. Minimum punishment in respect of certain offences.

**Stages of a crime:** mere intention not punishable, preparation, attempt- tests for determining what constitutes attempt- proximity, equivocality and social danger, impossible attempts.

### Module : 2

**General Exceptions:** Factors negative guilty intention: Mistake of fact not of law; judicial act, accident, necessity, minority and insanity; (Impairment of cognitive faculties, emotional imbalance) medical and legal insanity; Intoxication. Private defence justification and limits when private defence extends to causing of death to protect body and property.

### Module : 3

**Group Liability:** Common intention, unlawful assembly and common object. Abetment: instigation, aiding and conspiracy. Mere act of abetment punishable. Provisions relating to criminal conspiracy. Riot and affray.

**Offences against the state-**waging war against the state and sedition. Offences　against　public servant and public justice, Contempt of lawful authority of public servants; giving and fabricating false evidence and aggravated form of the crime.

### Module : 4

**Specific offences against Human Body :**
(i) Culpable homicide, murder, distinction between culpable homicide and murder. Situation

justifying treating murder as culpable homicide not amounting to murder-grave and sudden provocation, exceeding right of private defence, public servant exceeding legitimate use of force, death in sudden fight, death caused by consent of the deceased- euthanasia and surgical operation. Death caused of person other than the person intended. Rash and negligent act causing death.

(ii) Hurt- simple and grievous
(iii) Wrongful restraint and wrongful confinement
(iv) Criminal force and assault
(v) Kidnapping and abduction.

**Offences against women:-**

(i) Insulting the modesty of a woman, assault or criminal force with intent to outrage the modesty of a woman.
(ii) Miscarriage: Causing miscarriage without women's consent and causing death by miscarriage without women's consent.
(iii) Kidnapping or abducting woman to compel her to marry or force her to illicit

(iv) Buying or selling a minor for purposes of prostitution.
(v) Rape- custodial rape, gang rape, marital rape, unlawful sexual intercourse.
(vi) Prevention of immoral traffic and prevention of sati
(vii) Cruelty by husband or his relative
(viii) Dowry death
(ix) Prohibition of indecent representation of women

**Protection of Women from Domestic Violence Act, 2005:** Definitions, Power and duties of protection of officers and service providers, Application to Magistrate, Protection orders, Residence orders, Custody orders, Compensation orders and Monetary reliefs, Penalty for breach of protection orders by respondent.

### Module : 5

**Offences against property-** theft, extortion, robbery, dacoity, criminal misappropriation of property, criminal breach of trust, cheating, mischief and criminal trespass

**Offences relating to documents:** Forgery or making a forged document

**Offences relating to marriage:** Bigamy, marriage or fraudulently gone through without lawful marriage, adultery, enticing or deceiting a married woman.

**Defamation:** definition and exceptions

**Leading cases:**
- Reg v. Govinda IR 1876 1 BOM 342.
- Kedarnath v. State of Bihar AIR 1962 SC 955
- T.D. Vadgama v. State of Gujrat AIR 1973 SC 2313
- Veliji Ragahvji v. State of Maharashtra AIR 1965 SC 1433
- K.N. Nanavati v. State of Maharashtra AIR 1962 SC 605

**Select Bibliography:**
- Dr. Hari Singh Gour : Penal law of India
- Rattan Lal and Dhirajlal: The Indian Penal Code
- Dr. S.N. Mishra : The Indian Penal Code
- O.P. Srivastava : Principles of Criminal Law
- P.S. Achuthan Pillai: Criminal law
- T. Bhattacharya: Bhartiya Dand Sanhita
- K.D. Gaur : Cases and Materials on Criminal Law
- M.P. Tondan : Indian Penal Code

**Paper 7.5 Procedure Law – I (Cr.P.C.)**
### THE CODE OF CRIMINAL PROCEDURE, 1973, JUVENILE JUSTICE ACT, 2015 AND PROBATION OF OFFENDERS ACT, 1958

**Teaching Hrs.: L-04**                                              **Exam Hrs. – 3**

**Total : 100**                                                    **Marks : Internal 30 External 70**

<div align="center">

**Module : 1    The Code of Criminal Procedure, 1973**
</div>

**Preliminary:**
(a) Object, Extent and definitions (Chapter 1)
(b) Duties of Public: (i) To assist to police and Magistrate (ii) To give information about certain offences (Chapter IV Ss. 37 to 40)
**Criminal Courts:**
(a) Territorial divisions and Classifications (Chapter II, Ss 6 to 25).
(b) Powers (Chapter III, Ss. 26 to 31).

<div align="center">

**Module : 2**
</div>

**Pre-Trial Procedure :**
(a) Arrest of Persons (Chapter V)
(b) Process to compel appearance (Chapter VI).
(c) Process to compel Production of things (Chapter VII).
(d) Information to the Police and their powers of Investigation (Chapter XII)
(e) Bail (Chapter XXXIII).
(f) Jurisdiction of the courts in inquiries and trials (Chapter XIII); Order to furnish security            for keeping peace and good behaviour (ss. 106-124)
(g) Maintenance of Public Order and Tranquility (Chapter-X) Conditions requisite for initiation of proceedings, Complaints to Magistrates, Cognizance of Offence and Charge (Chapter XIV,
XV and XVII).

<div align="center">

**Module : 3**
</div>

**Types of Trials.**        (i)  Trial before Court of Session (Chapter XVIII).
(ii) Trial of Warrant and Summons Cases (Chapter XIX & XX)
(iii) Summary Trials (Chapter XXI)
(iv) Maintenance of Wife, Children and Parents (Sec. 125 to 128).

<div align="center">

**Module : 4    Judgment (Chapter XXVII)**
</div>

(a) Appeal (Chapter XXIX) Reference and revision (Chapter XXX).
(b) Misc. Provisions:
(i) Irregular proceedings (Chapter XXXV)
(ii) Period of Limitation (Chapter XXXVI)
(iii) Autrefois acquit and Autrefois convict (Sec 300).
(iv) Legal Aid to the accused at State Expenses (S. 303 & 304)
(v) Pardon to an accomplice (Sec 306 to 308)
(vi)Saving of Inherent powers of High Court (Sec. 482).

<div align="center">

**Module : 5    The Juvenile Justice Act, 2015.**
</div>

Definitions, Competent authorities and institutions for juveniles, Neglected Delinquent Juveniles. Procedures and competent authorities, special offences in respect of juveniles.

**Probation of offenders Act, 1958:**
Definitions, Power of court to require released offenders after admonition on probation of good conduct, power of Court to require released offenders to pay compensation under twenty one years of age, Variations of conditions of probation, Probation in case of 'Offender' failing to observe conditions of bond, provision as to sureties, Probation Officers, Duties of Probation Officers.

**Leading Cases :**
- Tehsildar Singh v. State of UP , AIR 1959 SC. 1012
- State of U.P. v. Singhara Singh, AIR 1964 SC 359.
- Nisar Ali v. State of U.P. AIR 1957 SC 336.
- Purshottam Das Dalmia v. State of West Bengal, AIR 1961 SC. 1589.
- State of Andhra Pradesh v. Cheemalapati Ganeshwara Rao, AIR 1963 SC 1850
- Satwant Singh v. State of Punjab, AIR 1960 S.C. 266.

**Select Bibliography :**
- Ratan Lal : Criminal Procedure Code.

- Ganguly, A.C. : A Guide to Criminal Code Practice.
- The Juvenile Justice (care and Protection of children) Act,2000.
- Probation of Offenders Act, 1958.
- Chakravarti, N.K. - Probation system - in the Administration of Criminal justice.
- Tiwari Y.K.- CR.P.C (Hindi)
- Jain P.C.- CR.P.C (Hindi)
- M.D. Chaturvedi- CR.P.C etc. (Hindi)
- B.L. Babel- CR.P.C (Hindi)

## Paper 7.6 Procedure Law – II (C.P.C.)
### THE CODE OF CIVIL PROCEDURE 1908 AND THE LIMITATION ACT, 1963

**Teaching Hrs. : L-04**                                   **Exam Hrs. – 3**
**Total : 100**                          **Marks  :  Internal  30**
**External 70**

### Module : 1
Definitions, suits in general, suits of civil nature, stay of suit, Res judicata, Res subjudice, Foreign Judgment.

### Module : 2
Place of trial, Transfer of suits, Joinder, non-joinder and mis-joinder of parties and causes of action, Service of Summon, Attachment before judgment, Arrest before Judgment. Supplemental proceedings.

### Module : 3
**Execution in general:** Courts by which decrees may be executed, powers of the court executing the decrees. Transfer of decrees for execution and modes of execution, Stay of execution, Suits in particular cases (Orders xxix to xxxiii). Abatement of suits, summary proceedings.

### Module : 4
Temporary injunction and Appointment of Receiver, Appeals-Appeals against order and appeal against decree, Review. Revision and Reference, Transfer of cases, Restitutions, Caveat, Inherent powers.

### Module : 5
The Limitation Act, 1963 (Omitting the Schedule) Definitions : Purpose, Policy, Scope, Applicant, bond, Defendant, easement, good faith, plaintiff, period of limitation Relationship between limitation, laches, acquiescence, estoppels and res judicata; Limitation of suits, appeals and applications, disability, computation of period of limitation, acknowledgement and part payment, acquisition of ownership by prescription

**Leading Cases:**
- Shri Sinha Ramanuja v. Ranga Ramanuja, AIR 1961 SC 1720.
- Seth Hukamchand v. Maharaja Bahadur Singh AIR 1933 PC 193
- Narain Bhagwant Rao v. Gopal Vinayak AIR 1960 SC 100
- Garikapati Veerava v. Subbiah Chaudhary, AIR 1957 SC 540.
- Deoki Nandan v. Murlidhar, AIR 1957 SC 133.
- Deity Pattabhirama Swamy v. Hanmayya, AIR 1959 SC 57.
- S.M. jakati v. B.M. Borker, AIR 1959 S.C. 282.

**Select Bibliography:**
- Mulla- Civil Procedure Code.
- Singh S.N. - Civil Procedure Code.
- Sahai on Civil Procedure.
- Tandon, M.P. - Civil Procedure Code (English & Hindi)
- Mridula Srivastava - Civil procedure Code (Hindi)
- A.N. Pandey - Civil Procedure Code (Hindi)
- C.K. Tekwani- Civil Procedure Code
- T.P. Tripathi- Civil Procedure Code (Hindi) Limitation ACT

# B.A. LL.B. 5 YEAR INTEGRATED
## (HONOURS COURSE FOR SESSION 2024-25)
### 4th Year (Semester –VIII)

### Paper 8.1  Sociology – IV
### Social Problems in Contemporary India

**Teaching Hrs. : L-04**                                     **Exam Hrs. – 3**
**Total : 100**                           **Marks : Internal 30 External 70**

#### Module : 1
**Social Problem:** meaning, concept and types. Crime and Delinquency: meaning, causes, types, theories and remedies.

#### Module : 2
**Issue of Population during 20th Century:** Population Problem, Population Education and programmes of control. Population Control -measures, causes for success and failure. Issue of Population in 21st Century: Demographic Dividend

#### Module : 3
Problem of Youth, Drug Abuse and AIDS, Problems of Women in India. Women Empowerment, Female foeticide.

#### Module : 4
Poverty, Unemployment and Illiteracy: causes forms and remedies. Human rights and Social Problems. Environment degradation and solutions.

#### Module : 5
Social Problems of special groups in India-The Scheduled castes, Scheduled Tribes and Other Backward classes. Problems of Minorities and Communalism.

**Select Bibliography:**
- Ahuja Ram.: Social Problems in India, Jaipur, Rawat. Beteille,
- Andre. 1974.: Social Inequality, New Delhi, Oxford University Press. Beteille,
- Andre. 1992.: Backward Classes in Contemporary India, New Delhi, Oxford University press. Berreman,
- G.D.1979.: Caste and other Inequalities: Essay in Inequality. Meerut, Folklore Institute.
- Guha, Ranjit, 1991. : Subaltern Studies, New York: Oxford University Press. Kothari,
- Rajni (Ed)1973.: Caste in Indian Politics Madan,
- G.R.: Social Problems in India. Madan, T.N. 1991.: Religion in India, New Delhi, Oxford University Press.  India Year Book, NBT, New Delhi.


### Paper 8.2  Jurisprudence

**Teaching Hrs.: L-04**                                      **Exam Hrs. – 3**
**Total : 100**                            **Marks: Internal 30 External 70**

#### Module : 1
**Introduction:** Meaning, definition, nature, scope and importance of Jurisprudence.
**Norms and the normative System:** Different types of normative systems, such as of games, language, religious orders, unions, clubs and customary practice. Legal systems as a normative order: similarities and difference of the legal system with other normative systems. Law: Nature and definition given by different jurists.

#### Module : 2
**Schools of Jurisprudence:** Analytical positivism, Natural Law School, Historical School, Sociological School Economic Interpretation of Law, Realist School.
**The Indian Jurisprudence:** Origin and its nature, The concept of 'Dharma'

#### Module : 3
**Purpose of Law:** Justice, meaning and kinds, Justice and law: Approaches of different schools; Power of the Supreme Court of India to render complete Justice in a case with special reference to Article 142. Critical studies, Feminist Jurisprudence.

**Sources of Law :** Customs, legislations, judicial precedent and Juristic writings as a source of law. Concept of Stare decisis, obiter dicta and Ratio decedendi.

## Module : 4

**Persons:** Nature of personality, status of the unborn, minor, lunatic, drunken, dead person, idol and mosque; corporate personality- Corporate sole and corporate aggregate; dimensions of the modern legal personality of non-human beings.

**Possession:** Concept and kinds of possession.

**Ownership:** The concept, kinds. Relation between possession and ownership.

## Module : 5

**Concept of legal rights**, its kinds and right-duty corelation.

**Title:**

**Property:** Concept and kinds of property.

**Liability:** Conditions required for imposing liability, wrongful act-damnum sine injuria and injuria sine damnum. Causation, mensrea, intention, motive. Malice, negligence and recklessness. Strict and vicarious liability.

**Obligation-** nature, kinds and sources of obligation.

**Procedure:** difference between substantive and procedural laws. Evidence-nature and kinds. Theory of Punishment, Administration of Justice, Capital Punishment.

**Leading Cases:**

- Keshavanand Bharti Vs State of Kerala, AIR 1973 SC 1461 (Per Mathew J.)-Paras 1617-1620 (Sovereignty)

  1685-1698 (Natural Law and Natural rights) 1726-1729 (Roscoe pound and Sociological Jurisprudence) 1738-

  1751 (Property rights and Social Justice).

- A.K. Gopalan Vs State of Madras, AIR 1950 SC 27 (S.970 paras 18, 19 Per Kania C.J.) Paras 107-109 (Per

  Patanjali Shastri) Para 192 (Per Mukherji J.) Paras 228 (Per Das J. Natural Law and Positive Law)

- Maharaja Shree Ummed Mills Ltd Vs Union of India, AIR 1963 SC 953 Paras 12, 13, 14 (Per SK. Das J.)

  Concept of Law; Legislative agreements)

- Jaipur Udyog Ltd Vs Income Tax Commissioner, AIR 1965 Raj 162 Paras 12, 13, 14 (Per Tyagi J.)

  (Sovereignty, Separation of powers and functions).

- Shrimati Indira Nehru Gandhi Vs Raj Narayan, AIR 1975 SC 2299 Paras 219 and 299 (Per Mathew J.)

  (generally as a property of law.)

- In Re Article 143 (Keshav Singh) AIR 1965 SC 745 paras 9-17 (Per sarkar J. Law making by judicial and

  legislative comity).

- Bengal Immunity Co. Vs State of Bihar, AIR 1955 SC 661 (Precedent)

- Trilokchand Motichand V. H.B Munshi AIR 1970 SC 898 (Para 4 to 11, per Hidayatulla CJ.) Para 36 per

  Bhachawat J.; Para 59-63 per hegde J.). These excerpt illustrate problems and uses of Hohfeld analysis.

- Menka Gandhi Vs Union of India, AIR 1978 SC 597

**Select Bibliography:**

- Salmond: Jurisprudence
- Dias: Jurisprudence
- Wayne Morrison: Jurisprudence
- Julius stone: The province and function of Law
- Holland: Jurisprudence
- S.N. Dhyani: Jurisprudence- A study of Indian Legal Theory
- N.V. Paranjape: Vidhi Shastra
- V.D. Mahajan, Jurisprudence and Legal theory
- Bodenheimer Jurisprudence- The Philosophy and method of law.
- Mulla- Hindu Law
- Mani Tripati- Jurisprudence (Hindi)

## Paper 8.3  ARBITRATION, CONCILIATION AND ALTERNATIVE DISPUTES RESOLUTION SYSTEMS

**Teaching Hrs. : L-04**                                    **Exam Hrs. – 3**
**Total : 100**                              **Marks : Internal 30 External 70**

### Module : 1
**Arbitration and Conciliation Act, 1996:** General provisions: Arbitration agreement; Arbitral Tribunal : Composition and Jurisdiction; Conduct of Arbitral Proceeding.

### Module : 2
**Arbitral awards:** Termination of proceedings, setting aside the Arbitral award; Enforcement of Arbitral awards, Appeals; Code of ethics for Arbitrators.

### Module : 3
Enforcement of Foreign-awards; Geneva Convention International arbitration institutions Conciliation: conciliators, appointment of conciliators, relationship of conciliators with the parties, settlement agreement status and effect of settlement agreements. Terminations of conciliation proceedings, resort to judicial proceedings, cost and deposits.

### Module : 4
**Alternative dispute & resolution system:** Objects and role of committee for implementation of legal aid schemes (CILAS). The Legal services authorities act, 1987 (as amended by the act of 2002)- The national legal service authority, State legal service authority and District legal service authority- constitution and functions;

### Module : 5
**Lok Adalat:** Organisation, cognizance of cases, award and powers. Permanent Lok Adalat- establishment, cognizance of cases, procedure and award. Study of other alternative dispute resolution system in brief such as Nyay Panchayat and Family courts.

**Leading Cases:**
- Sundaram Finance Ltd. v. NIPC India Ltd. (1999) 2 SCC 479
- NMTC Ltd. v. Sterlite Industries Ltd. 1996(4) SCC 219
- Lotus Investment and Securities v. Pramod S. Tiberwal 1996(2) SCC 579
- State of Rajasthan v. Bharat Construction Co. 1998 (4) CCs  172 (Raj.)

**Selected Bibliography:**
- G.C. Mathur, Arbitration and Conciliation Act, 1996.
- S. Krishnamurthy: Law of Arbitration and Conciliation.
- P.M.Bakshi: Arbitration Law.
- O.P. Tiwari: The Arbitration and Conciliation Act, 1996
- Avtar Singh: Law of Arbitration and Conciliation.

## Paper 8.4 Law of Evidence

**Teaching Hrs. : L-04**                                    **Exam Hrs. – 3**
**Total : 100**                              **Marks  :  Internal  30 External 70**

### Module : 1
**Preliminary:** Application of Indian Evidence Act. Definitions: Court, fact-fact in issueand relevant fact, evidence - meaning and its kinds, proved, disproved, not proved, may presume, shall presume and conclusive proof, Presumptions of fact and law, presumptions regarding documents. Relevancy of facts : Explaining Res-gestae, occasion, cause, effect; motive, intention, preparation, previous and subsequent conduct, introductory and explanatory facts, facts not relevant when become relevant, accidental and incidental facts. Facts which need not be proved, improper admission and rejection of facts.

### Module : 2     Admission and Confession
(a) Admission: Definition, whose admission is relevant, relevancy of admission in civil cases, admission is not conclusive proof. Admission and Estoppel.

(b) Confession: definition, its kinds, confession caused by inducement, threat or promise, confession to police officer, confession in the custody of police, confession to Magistrate, confession by co-accused.

(c) Difference between admission and confession, Relevancy of statements.

(d) Dying Declarations: The justification for relevance on dying declarations (Section 32), The judicial standards for appreciation of evidentiary value of dying declarations. Other Statement by Persons who cannot be called as Witnesses: General Principles, Special problems  concerning violation of women's rights in marriage in the law of evidence.

## Module : 3

**Statement made under special circumstances.**

**Relevancy of judgement of a court of law.**

**Opinion of third person.**

**Opinion of experts / third person.**

**Relevancy of character**

**Evidence:** Oral evidence, documentary evidence, kinds of documentary evidence, when secondary evidence is relevant. Public and private document. Exclusion of oral evidence by documentary evidence: Application of this principle and its exceptions, ambiguous documents, kinds of ambiguity.

## Module : 4

**Burden of Proof:** Meaning, general principles of burden of proof in civil and criminal cases and exceptions to it. When burden of proof shifts, proof of legitimacy of child, proof in dowry deaths and in the matters of rape.

**Estoppels:** meaning, essentials, nature and its kinds. Competency of witnesses, when a person can be compelled to appear as witness, privileged communications and documents, accomplice, hostile witness.

## Module : 5

**Examination of Witnesses:** Order of examinations. kinds of examinations. leading question, impeaching the credit of witness, questions which can and which cannot be asked, refreshing the memory of witness, production of documents, Judge's power to put questions and to order production. Effect of improper acceptance or rejection of evidence.

**Leading Cases:**

- Nishi Kant Jha v. State of Bihar, AIR 1969 SC 422.
- Himachal Pradesh Administration v. Om Prakash AIR 1972 SC 975.
- Sat Paul v. Delhi Administration, AIR 1976 SC 294.
- Laxmipat Chorasia v. State of Maharashtra, AIR 1968 SC 938.
- Pakala Narayan Swami v. Emperor, AIR 1939 PC 47.
- Bhardwade Bhogin Bhan Herrji Bhai v. State of Gujarat AIR 1988 SC 753.
- RM Malkani v. State of Maharashtra, AIR 1973 2SCR 417

**Select Bibliography:**

- Ratan Lal & Dhiraj Lal-The law of Evidence
- Batuklal- Law of Evidence
- Vepa P. Sarathi - Law of Evidence
- Raja Ram Yadav- Law of Evidence

**Paper 8.5  DRAFTING, PLEADING, CONVEYANCING  AND MOOT COURT TRIAL**

**Teaching Hrs. : L-04**                                        **Exam Hrs. – 3**

**Total : 100**                                        **Marks : Internal 30 External 70**

### Module : 1

**Pleading:** Meaning, Kinds; Fundamental principles of pleading and their exceptions, amendment of pleadings, alternate and inconsistent pleadings Doctrine of set-off: Legal set-off and equitable set-off

### Module : 2

**Drafting of pleadings Civil:** Plaints, written statement, Original Petition, Affidavit,  Notice, Execution Petitions, Memorandum of Appeal, Execution of Writ Petition. and Judgement writing

### Module : 3

Criminal complaints, Bail Application, Accused Reply, criminal Miscellaneous Petition, Appeal, Reference and Revision.

**Conveyancing:** Meaning, General Rules of Conveyancing, Salient parts of conveyancing, rules relating to the drafting.

**Module : 5**

**Drafting of Deeds:** Partnership deed, mortgage by conditional sale, notice for eviction, writing of government contract, sale deed, Mortgage Deed, Gift Deed, Lease Deed, Rent Deed, Power of Attorney, Promissory Note and will.

## Paper 8.6 MOOT COURT and MOCK TRIAL

| | |
|---|---|
| **Teaching Hrs. : L-04** | **Exam Hrs. – 3** |
| **Total : 100** | **Marks : Internal 100** |

Moot Courts The teacher teaching this course will supply three Moot Court problems to the students in the course of a single semester requiring them to work on all three problems assigned to them, prepare written submissions (memorials) and present oral arguments in a moot court setting. 30 marks for this component are divided equally between written submission and oral arguments.

Students may be asked to work in teams at the discretion of teacher. Each student will prepare a case only on one side.

**A. Rules of Memorial submissions:**

1. Each student/team must submit one typed and bound copy of the memorial on either side no later than the date fixed and announced in the class. Memorials will not be accepted after the prescribed date and time and the student will loose the marks assigned for that assignment.

2. Memorial specifications:

(a) Memorials must be printed on A4 size white paper with black ink on both sides of the paper. (b) The body of the memorial must be in Fonts Times New Roman, Size 12 and footnotes in Fonts Times New Roman in Size 10.

(c) Each page must have a margin of at least one-inch on all sides. Do not add any designs or borders on the pages.

(d) Memorials should be submitted with differently colored Title Page for each side: Title page in red colour for Petitioner/Appellant. Title page in blue colour for respondent.

(e) The Memorial should not exceed 20 typed pages (line space 1.5) and shall consist of the following Parts:

• Table of Contents • Statement of Facts • Statement of Jurisdiction List of References and Cases
• Statement of Issues • Summary of Arguments • Detailed Pleadings • Prayer • Affidavit, if necessary

(f) Relevant Annexure may be kept by the student and may be used during oral arguments, if necessary.

**B. Rules of Oral Arguments:** • Court Language shall be English. • Each student would be given 10 minutes to present their oral arguments • Judges may, at their discretion extend oral argument time, up to a maximum of 5 minutes. • Rebuttal would be allowed only to the petitioner and they would have to specify in the beginning the time they want to set apart for rebuttal.

**C. Evaluation:** The oral performance will be evaluated on the basis of communication skills, application of facts, persuasion / use of authorities, and response to questions.

**Mock Trial:** The students would be required to conduct trial in two cases, one Civil and one Criminal during the course of the semester. The students will be divided in teams of lawyers and witnesses. Each student will be required to function as a lawyer and witness in the trials being simulated in the classes. Students' performance will be evaluated on the basis of equal marks being assigned for case analysis, written submissions, Examination-in-chief, Cross-examination, and final arguments. 5 marks will be assigned for performance as witnesses.

# B.A. LL.B. 5 YEAR INTEGRATED
## (HONOURS COURSE FOR SESSION 2025-26)
### 5th Year (Semester –IX)

### Paper 9.1 Forensic Science

**Teaching Hrs. : L-04**                                    **Exam Hrs. – 3**
**Total : 100**                          **Marks : Internal 30 External 70**

### Module : 1
1. Different areas of Forensic Science.
2. Role & Scope of Forensic Science
3. Forensic Identification
4. Forensic Toxicology
5. Post Mortem Investigation
6. Forensic Analysis in Criminal Investigation
   Constitutional & Legal Issues
   Provisions Under Cr.P.C.
7. Medical Opinion:

F.I.R., Evidently Value of statements recorded under section 161&164 of Cr.P.C., Confession, Dying Declaration, Case Diary, Expert Opinion, Value of Medical Opinion

### Module : 2
**Medical Negligence & Consumer Protection Act**
Negligence, Negligence & Its relation with 'Copra', Definitional Aspects, Civil & Criminal Negligence, Degree of Negligence.

**Human Right And Medicine**
Forensic Science in the service of Human Rights
Forensic Science Services and the crime scene Investigation Process

**Types of Torture:** Impalement, Neck Torture, Crucifixion, Rape Torturer, Forens Readiness & Forensic Readiness

### Module : 3
1. **Medico Legal Aspects of Injuries:** Types of Injuries, Opinion of Medial Officer
   **Injuries caused by:** Knife, Sharp edged weapon, Sharp edged heavy cutting weapon and built weapon like stone.
   a. **Medico Legal Aspects of Wound:** Incised wound, Lacerated wound / Inside wound distinction, Injuries of the head and spine cranio-cerebal injury/

### Module : 4
1. **Death :** Definition, Notification certification, registration presumption
   **Mode of Death:** Asphyxia, Hanging, Strangulation, Suffocation Drowning, Throttling
2. **Post-Mortem Examination:** Special Investigation in purified bodies, Staining, Method of making a post mortem examination for medico legal purpose, Internal Examination of Body, Post mortem Report

### Module : 5
1. **Test Tube Techniques:** Types, Issues of Adultery, Divorce, Nullity of Marriage (Voidable), Issues of morality or test tube insect, Issues of Legitimacy, Issues of Surrogacy, Issues of Health Risk to baby, ICMR Guidelines for IVF Clinics, Determination of states of the Child, IVF – ET, Invitro Culture Media.
2. **DNA Legislation:** DNA Profiling, Evidence Examination, Importance of Profiling in forensic Science, DNA Profiling V/S Finger Prints, Identifying victims using DNA., U/S-53 Cr.PC: Examination of accused, does not apply to complaint case, suggestion for legal reforms in effective application of DNA technology in our country.
3. **Narco Analysis:** Concept in view of constitutional law & Human Rights, Efficacy
4. **Polygraph Test:** Polygraph Test, Limitation of Polygraph text, Utility: in investigation & Judicial Process, Admissibility of Polygraph Test.

<h1 style="text-align:center">Paper 9.2 COMPARATIVE CRIMINAL PROCEDURE</h1>

**Teaching Hrs.: L-04**                                    **Exam Hrs. – 3**
**Total : 100**                              **Marks : Internal 30 External 70**

<h2 style="text-align:center">Module : 1</h2>

Introduction to Criminal Justice Process, Historical Evolution of Criminal Justice System, Common Law System v. Civil Law System, Adversarial model, Inquisitorial model, Hierarchy of criminal courts and their jurisdiction, Nyay Panchayat in India., Prosecutors in India and their counterparts.

<h2 style="text-align:center">Module : 2</h2>

Role of the Police and its powers, Role of the Police and its obligations under the Cr.P.C, Police Powers in England- Power of Stop, entry, search, arrest and detentio, Police Powers in the USA-From 4th Amendment to 14th Amendment to the US Constitution. Rights of the arrestee. Power to stop, frisk, search, seizure and arrest, Policing in Continental Countries.

<h2 style="text-align:center">Module : 3</h2>

Investigation, Charging Process, Prosecution of Case, Framing of Charge under the Cr.P.C, Charging Process and case management under the UK system, Prosecution of a Criminal case, Charging Process in the USA. Role of the prosecutor and charging decision, Criminal Investigation in Continental Countries.

<h2 style="text-align:center">Module : 4</h2>

Fair Trial Procedure and Stay of Prosecution, Concept of Fair Trial under the Indian Constitution, Stay of proceedings under the Cr.P.C, Abuse of Process and Stay of Prosecution under the UK System, Fair Trial Principles under US Constitution. Pre-Trial Motions.

<h2 style="text-align:center">Module : 5</h2>

Trial Procedure, Trial Process in India under the Cr.P.C, System of Courts in UK, Trial Process in UK, Jury system, Trial Process in US. Preliminary hearing, Grand Jury hearing, Arraignment.

<h1 style="text-align:center">Paper 9.3 CRIMINAL PSYCHOLOGY</h1>

**Teaching Hrs. : L-04**                                    **Exam Hrs. – 3**
**Total : 100**                                    **Marks : Internal 30 External 70**

<h3 style="text-align:center">Module : 1     Psychology of Criminal Behaviour</h3>

Definition, nature and scope of criminal psychology.Theories of Crime:
a. Psychological Theories      b. Social Theories      c. Personality stress behaviour  Crime trends in India,   Prevention of crime

<h3 style="text-align:center">Module : 2     Psychological Disorders and Criminal Behaviour</h3>

Psychopath–Juvenile delinquency, Mentally ill offenders, Serial killers & Rampage killers, Sex offenders.

<h3 style="text-align:center">Module : 3     Police Psychology</h3>

Criminal competencies, Psychological autopsy–and manner of death, Psychological profiling and personality of criminals in the context of Law, Future predictions of criminal behavior on the basis of criminal profiling.

<h3 style="text-align:center">Module : 4     Violent Criminal behavior and Drug related crime</h3>

Psychology of aggression and violence, Terrorism – Domestic and international, Drugs and Crime, Cyber crimes – defined governed, Cyber- terrorism, bullying, harassment, stalking.

**Module : 5     Selection & Training of law enforcement personnel**Selection of the police officers: Pre-employment selection, fitness for duty evaluation, psychometric     tools, Training of the police officers: Interactions with the mentally ill, domestic disturbance, Hostage negotiations, Personality of Police officers, Job stress and discretion.

<h3 style="text-align:center">Paper 9.4 Information Technology Offences</h3>

**Teaching Hrs. : L-04**                                    **Exam Hrs. – 3**
**Total : 100**                          **Marks : Internal 30 External 70**

## Module : 1

Introduction  Historical development – Classification of cybercrime – Conventional crime vs. cybercrime Causes for cybercrime – Trends in cybercrime worldwide.

## Module : 2

Typology of Cybercrime  Hacking, cracking, DoS–Viruses, worms, malwares, bombs, email bombing, data diddling, salami attacks, phishing, stenography, cyber stalking, spoofing, pornography, defamation, computer vandalism, cyber terrorism, cyber warfare, crime in social media, social engineering, credit card frauds and financial frauds, telecom frauds.

## Module : 3

Cybercrime Investigation Cyber/Digital forensics–Cyber forensics life cycle–Chain of custody– Search, seizure and preservation of digital evidence–Data privacy issues–Cryptography–Cybercrime cells–Cyber appellate authorities.

## Module : 4

Cyber Laws  Cyber laws in India – Information Technology (amended) Act, 2008 – Indian Evidence Act, 1872 – Digital evidence – Cyber laws across the globe – UNCITRAL

## Module : 5

Cybercrime and Counter-measures  Information security – Best information security practices in India and other countries – E-mail security – Web application security, malware security, network security, cloud security and wireless security.

**Select Bibliography:**

- Atkins, D., Buis, P., Hare, C., et al. (1997). Internet security professional reference (2nd ed.). Indianapolis, IN:  New Riders Pub.
- Goodman, S., & Soafer, A.(ed.) (2002). The Transnational Dimensions of cybercrime. Washington: Hoover  institution Press.
- Marcella, A.J., & Greenfield, R.S. (ed.) (2002). Cyber Forensics: A field manual for calculating, examining and preserving evidence of computer crimes. Boca Raton, Florida: Auerbach.
- Reyes, A. (2007). Cybercrime investigations bridging the gaps between security professionals, law enforcement  and prosecutors. Rockland, MA: Syngress Pub.
- Walker, C. (1998). Crime, criminal justice and the Internet. London: Sweet & Maxwell.

## Paper 9.5 Internship

**Teaching Hrs. : L-04**                                    **Exam Hrs. – 3**
**Total : 100**                                    **Marks : Internal 100**

This part will require the students to be attached with practicing lawyers with a minimum of ten years standing at the Bar. A minimum of two hours are to be spent daily with the lawyer observing client dealings, drafting, conducting fact investigations, etc., for at least twenty-four days in the semester. At the end of internship, a certificate confirming the student's attendance at the lawyers office will have to be produced.

**Select Bibliography:**

- NRM Menon (ed.) Clinical Legal Education (1998)
- Don Peters, The Joy of Lawyering: Readings for Civil Clinic (1996)
- B.Malik, The Art of a Lawyer (9th Ed. 1999)
- Steven Lubet, Modern Trial Advocacy: Analysis and Practice (1993)
- Thomas A.Mauet, Trial Techniques (1996)
- Thomas A.Mauet, Pre- trial (1995)
- Inns of School of Law, Advocacy (1999/2000)
- Inns of School of Law, Case Preparation (1999/2000)

# B.A. LL.B. 5 YEAR INTEGRATED
### (HONOURS COURSE FOR SESSION 2025-26)
### 5<sup>th</sup> Year (Semester –X)

### Paper 10.1  Offences against Child and Juvenile Offence

**Teaching Hrs.: L-04**                                          **Exam Hrs. – 3**

**Total : 100**                                          **Marks : Internal 30 External 70**

**Module : 1**

     **Introduction:** Criminal Justice System (CJS): Meaning, purpose and social relevance - Legislative process and CJS- Historical evolution–Overview of criminal justice sectors National and International perspective - Accusatorial and inquisitorial systems of Criminal Justice System - Co-ordination in CJS.

**Module : 2**

     **Police System:** Organization set up of Indian police in modern society - Objective of police system: Maintenance of law and order, investigation of crimes, protection of life, production of property rights, prevention of crime - Method of interrogation, role of counselling in interrogation - Functions of Police Organizations interface with the community, executive, prosecution and judiciary - Police image.

**Module : 3**

     **Judicial System:**  Importance of judicial system in modern society - Judicial administration in India. Presiding Officer, Prosecutor and Defence Counsel - Salient feature of India Judicial System : Independence, public and fair trial - Fundamental elements in judicial functioning: Due process, speedy trials and access to justice - Alternative Dispute Redressal System (ADRS): Mediation, Lok Adalat, Village Nyaya Panchayat - Judicial Administration: Modernization and reforms.

**Module : 4**

     **Juvenile Justice System:** Challenges faced by children- Child Rights as per the UNCRC 1989 - National Legislative measures for protection of Child Rights: Commission for Protection of Child Rights Act, 2005, sexual harassment of women at work place (Prevention, Prohibition and Redressal) Act, 2013, the Right of Children for free and compulsory Education, Act 2009.,  JJ Act 2000 and Amended Act 2006, Immoral Traffic Prevention Act 1956 - Institutional Care and Support for juveniles/children - The role of police with special reference to children – Special Juvenile Police Unit (SJPU), Child Welfare Officer - Role of parents, teachers, doctors and welfare organizations in child upbringing and safety.

**Module : 5**

     Youth in Conflict with Law, Violence & Intervention Strategies Youth deviance-recent trends-pornography, MMS, Sexual Harassment - Youth violence-state response-state violence - Juvenile gangs, status offence - Youth alienation and crimes - Domestic Prevention Act, violence against elderly people, violence against disabled - Intervention strategies: Counselling, restoration/repatriation of Children, after-care, adoption, foster care & sponsorship, issues and problems in reintegration.

**Select Bibliography:**

- Qadri, S.M.A. (2005). Criminology, Eastern Book Company.
- Gupta M.C., (2001). Child Victims of Crime, Gyan Publishing House.
- Les John (2002). Crime and Modernity, New Delhi: Sage Publications.
- Hagan, Frank (2008). Introduction to Criminology, Sage Publication Inc.
- Williams, Katherine (2004). Textbook on Criminology, Universal Law Publications.
- Reports by the International Conventions and UN Declaration.
- Shweta (2009). Crime, Justice and Society, MD Publications.
- Schmalleges Frank (1999). Criminal Justice Today, New Jerscy: Prentice Hall.
- Justice Malimath Committee on Criminal Justice Reforms, Universal Law Publication (2003).
- Padmanabhaiah, K. (2001). Committee Police Reforms.
- Banerjee, D. (2005). Central Police Organizations Part I and Part II, Allied Publishers Pvt. Ltd.
- Reisd, Se Titus (2006). Crime and Criminology. Mc. Graw Hill Publishers.

### Paper 10.2  Women and Criminal law

**Teaching Hrs. : L-04**                                          **Exam Hrs. – 3**
**Total : 100**                                          Marks   :   Internal   30
**External 70**
**Module : 1**
Basic concepts:  Sex and Gender; Femininity and masculinity; Patriarchy; Cultural Images of Women; Negative Stereotypes of Women.
**Module : 2**
Feminism: Meaning and emergence of feminism; Types of feminism; Post-feminism and anti-feminism.
**Module : 3**
Domestic Violence Act, 2005, The Pre-Conception and Pre-Natal Diagnostic Techniques Act, 1994
**Module : 4**
The Commission of Sati (Prevention) Act, 1987, The Dowry Prohibition Act, 1961, The Immoral Traffic (Prevention) Act, 1956
**Module : 5**
Sexual harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013
The Prohibition of Child Marriage Act, 2006,  Matrimonial offences under the Indian Panel Code,1860
**Select Bibliography:**

- Bhasin, Kamla & Nighat Said Khan. 1986. Some Questions on Feminism and its relevance in South Asia. Raj
  Press. New Delhi.
- Bhasin, Kamla. 2000. Understanding Gender. Kali for Women. New Delhi.
- Bhasin, Kamla. 2004. Exploring Masculinity. Kali for Women. New Delhi.
- Bhasin, Kamla. 2004. What is Patriarchy? 5. Chacko, Shubha. 2001. Changing the Stream: Backgrounder
  on the Women's Movement in India. CED. Bangalore.
- Freedman, Jane. 2002. Feminism. Viva Books. New Delhi.
- John, E Mary. 2004. 'Gender and Development in India, 1970-90's: some reflections on the constitutive
  role of context' (ed.) Chaudhuri, Maitrayee. Feminism in India, New Delhi: Kali for women.
- Kabir, Naila. 1995. 'Empowerment from below: Learning from the grassroots'. Pg 223-265. (Ed) Kabir,
  Naila. Reversed Realities: Gender Hierarchies in Development Thought. New Delhi: Kali for women.
- Sexual Harassment at the workplace – A Guide. Sakshi, New Delhi.
- Saheli 1981-2006. 2006. New Delhi: Saheli Publication.

## Paper 10.3  Criminal Sociology

**Teaching Hrs. : L-04**                                          **Exam Hrs. – 3**
**Total : 100**                                          **Marks : Internal 30 External 70**
**Module : 1**
   **Introduction:** Concept of Crime: Meaning; Causes of Crime.
**Module : 2**
   Sociological Explanation of Criminal Behaviour: Theory of Differential association; Theory of delinquent sub-culture; Anomie Theory; Labelling Theory.
**Module : 3**
   **White Collar Crime:** Meaning and nature of white collar crime; Genesis of white collar crime; Scope of white collar crime; Preventive measures.
**Module : 4**
   Punishment and correctional methods: Punishment Theories: Retributive, Deterrent, Reformative; Correctional methods: Prison based, community based; Probation, Parole, Open Prison.
**Module : 5**
Offences relating to marriage & Offences relating to Religion.
**Select Bibliography:**

- Ratanlal Dhiraj lal, 1860. The Indian Penal Code: Lexis-Nexis
- Russell, William, 1964.Crime: Vol. I & II, London: Stevens and sons.
- Tapas K Banarjee, 1963.Background to Indian Criminal Law, Kolkata: Cambray.

- John Lewiss Gillim 1945.Criminology and Penology, New York: Greenwood Press
- J.P. Sirohi : Criminology and Criminal Administration, Allahabad Law agency
- Criminal Procedure Code 1978
- Teeters Negley and Harvey Elnar Barnes, 1959. New Horizons in Criminology, New Delhi: Prentice Hall of India.
- Sutherland Edwin H. and Donald R. Cressey, 1968. Principles of Criminology

## Paper 10.4  Penology and Victmology

**Teaching Hrs. : L-04**                                   **Exam Hrs. – 3**
**Total : 100**                                  **Marks : Internal 30 External 70**

### Module : 1

Origin and evolution of Punishment; Control of Crime: Police and Law courts, Prison system, Re-socialization of the offender, Rehabilitation of discharged prisoners in the administration of Criminal justice, prevention of crime delinquency.

### Module : 2

Punishment, Relationship between Criminology and Penology; Theories of Punishment: Expiatory, Preventive and reformative and purposes of punishment.

Penal Science in India: History of Punishment, Pre-classical School, Neoclassical, Positive School. Reformers, Clinical School and multiple causation approach.

### Module : 3

**Miscellaneous:** modes of treatment of offenders, corporeal punishment, Transportation of criminals, Capital punishment, imprisonment, reactional treatment, parole, compensation, admonition, sex and adolescent offenders, indeterminate Sentences, Borstal School, Criminal procedural Jurisprudence.

**Constitutional Guarantees:** Principles of natural Justice as applicable in procedural law, Protection to arrested persons. Under-trials, detenue and convicted persons. Double jeopardy, self-in-crimination and right to life and legal aid.

### Module : 4

Meaning and Definitions of Victim; Classification of Victims ; Conceptual aspect of Victimology; Theories of Victimology; Victim's Rights under ;

**International Conventions:** U.N. Declaration of Basic Principles of Justice for Victims of

Crime and  Abuse of Power 1985 ;  Handbook of Justice for Victims 1999; The Rights to Reparation for victims of Human Rights Violation  (1997); UN Convention on Justice and Support for Victims of Crime and Abuse  of  Power (14 November 2006); Rights of victims under International Criminal Courts

### Module : 5

Compensation to victim under the Motor Vehicles Act, 1988, Compensation to Victim under Criminal Procedure Code, 1973, Compensation under Workmen's Compensation Act, 1923, Compensation under Probation of Offenders Act, 1958, Compensation under the Indian Fatal Accidents Act, 1855, Compensation payable under the Railway Act, 1989 (Sec.123)

**Leading Cases:**
- Gura Singh v. State of Rajasthan, 1984 Cr. LJ 1423 (1428)
- Francis Coralie Mullin v. Union Territory Delhi, AIR 1981 SC. 746.
- R.K. Garg v. Union of India (1981) 133 ITR 239.
- Mithu v. State of Punjab, AIR 1983 SC 473.

**Select Bibliography:**
- Barnes, H.B. - Teeters - New Horizons in Criminology.
- Vold, G.S. - Theoritical Criminology.
- Pillai, K.S. - Criminology.
- R. Taft, Donald - Criminology.
- Edwin, H. Sutherland and Donald R. Grussey- Principles of Criminology
- Horman Mannhaim - Pioneers in Criminology.

- Hon, Barren, Mays - Crime and the Social Structure.
- Ahmed Siddiqui - Criminology - Problems & Perspectives
- Lord Pakenham - Causes of Crime.
- S.Venugopala Rao - Facts of Crime in India.
- Korm, R.R. and Mc Gorble, LW - Criminology and Penology.
- Grunhut - Penal Reforms.
- Mandholm - Criminal Justice and Reconstruction.
- Garden Rose - The Struggle for Penal reform.
- I.L.I. - Essays on Indian Penal Code.
- Ben - Penology - Old and New - Tagore Law Lectures.
- Elliot - conflicting Penal Theories in Statutory in Criminal Law.
- Shamshul Huda - Tagore Law Lectures on Criminal law.
- Lawburse - Crime, Its causes and Remedies.
- Dequires - Modern Theories of Criminology.
- Gillin - Criminology and Penology.
- Deccaria - Crime and Punishment.

## Paper 10.5 Court Visit

| | |
|---|---|
| **Teaching Hrs.: L-04** | **Exam Hrs. – 3** |
| **Total : 100** | **Marks : Internal 100** |

During the court visits, the students will be required to observe the following stages in cases: Framing of charges / issues
1. Examination-in-Chief
2. Cross-examination
3. Final Arguments
In the lawyer's chamber they are required to do the following:
1. Read minimum of four case files to learn how files are prepared and maintained
2. Learn how to maintain records and accounts
3. Do legal research in at least two cases
4. Draft minimum of two documents in an ongoing case in the chamber
5. Observe client interviewing and counselling with the permission of the lawyer and clients in at least two cases In court visits the students are required to observe the following stages and write reports of their observation in the diary:
• Framing of charges • Examination-in-Chief • Cross-examination • Final arguments
The students are expected to maintain a diary of their field visits, work done during placement and their observations. In the diary, keep a log of the time spent each day including factual accounting of your experience of what you are doing, seeing and hearing. However, the diary should not be only descriptive of each day but should focus on what you learnt during the day. What were you thinking and feeling about your experiences? What is exciting or surprising? What is bothering you? What are your questions or insights about lawyering and judging? What criticism or praise do you have for the legal system? What else would you like to be taking place in your experience? Please be careful that while writing your accounts you do not reveal any confidential information. The diary should contain two parts:
(a) the factual and analytical information about your internship; and
(b) two legal documents drafted by you during internship. Each part will be evauated separately for 15 marks each. This part carries a total of 30 marks. The diary is an integral part of the course and you will be evaluated in terms of thoughtfulness and reflections about your learning experience. Be sure to write the journal in your own words even if you went with another class fellow or were in a group and observed the same things. If two students are found to have copied each other's language, both the students will be given a zero for that work. There is no written examination in this course at the end of semester. Students will be evaluated on the basis of their performance in the practical exercises conducted during the classes. The examination in this paper is divided in four parts.

Part A consists of Moot courts focused on appellate advocacy and carries 30 marks; Part B is dedicated to training the students in skills of trial advocacy and carries 30 marks; Part C aims at imparting practical experience to students through internship, court room and Chamber visits. This part carries 30 marks. Ten marks will be given for participating in 100% classes. Two marks will be deducted for each block of 5% attendance less than 100% to the maximum of minus ten marks. 96-100% attendance = 10 marks 91-95% attendance = 8 marks 86- 90% attendance = 6 marks 81-85% attendance = 4 marks 76-80% attendance = 2 marks Less than 76% = 0 marks

**Select Bibliography:**

- NRM Menon (ed.) Clinical Legal Education (1998)
- Don Peters, The Joy of Lawyering: Readings for Civil Clinic (1996)
- B.Malik, The Art of a Lawyer (9th Ed. 1999)
- Steven Lubet, Modern Trial Advocacy: Analysis and Practice (1993)
- Thomas A.Mauet, Trial Techniques (1996)
-Thomas A.Mauet, Pre- trial (1995)
- Inns of School of Law, Advocacy (1999/2000)
- Inns of School of Law, Case Preparation (1999/2000)

# M.G.S. UNIVERSITY, BIKANER

# SYLLABUS

## SCHEME OF Examination and Syllabus

## FACULTY OF LAW

## LL.B.

**LL.B. FIRST YEAR EXAMINATION – 2022**

**LL.B.SECOND YEAR EXAMINATION -2023**

**LL.B.THIRD YEAR EXAMINATION -2024**

**ORDINANCES RELATED TO LL.B. EXAMINATIONS**
**(Three - Year Course)**
**(New Scheme)**
**BECHELOR OF LAWS**
**EXAMINATIONS - FACULTY OF LAW**

### LL.B. First Year Exam. 2022

First eight papers of LL.B. First Year Examination shall be of 100 marks and of 3 hours duration and the ninth paper(Practical Paper) shall contain two parts- Theory Paper shall be of 80 marks and 3 hours duration and Practical shall be of 20 marks.

Compulsory Papers:

1.1    Contract-I (General Principles of Contract, and Consumer Protection Act, 2019) (as amended up-to date).
1.2    Contract-II (Specific Contract, Sale of Goods Act, 1930, Indian Partnership Act, 1932 and Specific Relief Act, 1963)
1.3    Law of Torts and Motor Vehicle Act.
1.4    Family Law-I (Hindu Law)
1.5    Family Law-II (Mohammedan Law)
1.6    Constitutional Law of India - I
1.7    Constitutional Law of India - II
1.8    Environmental Law

**Optional Paper (Any One)**

1.9    (a) Legal and Constitutional History of India.
1.9    (b) Rajasthan Local Laws
1.9(c) Criminal Minor Acts

**Practical Paper:**

1.10   Professional Ethics, Lawyer's accountability and Bar-Bench relations.

### LL.B. Second Year Exam. 2023

First nine papers of LL.B. Second Year Examination shall be of 100 marks and of 3 hours duration and the tenth paper(Practical Paper) shall contain two parts- Theory Paper shall be of 80 marks and 3 hours duration and Practical shall be of 20 marks.

**Compulsory Papers:**

2.1    Jurisprudence
2.2    Law of Crimes
2.3    Law relating to Transfer of property & Easement
2.4    Company Law
2.5    Public International Law
2.6    Labour Laws-I
2.7    Labour Laws-II
2.8    Administrative Law

**Optional Paper: (Any One)**

2.9    (a) Taxation Law

2.9    (b) Insurance Law

2.9    (c) Banking Law including Negotiable Instrument Act, 1881.

**Practical Paper:**

2.10   Public Interest Lawyering, Legal Aid and Para Legal Services.


## LL.B. Third Year Exam 2024

First eight papers of LL.B. Third Year Examination shall be of 100 marks and of 3 hours duration and the ninth and tenth paper(Practical Paper) shall contain two parts- Theory Paper shall be of 80 marks and 3 hours duration and Practical shall be of 20 marks.

**Compulsory Papers:**

3.1    Law of Evidence

3.2    The Code of Criminal Procedure, 1973, Juvenile Justice Act, 2015 and Probation of Offenders Act, 1958.

3.3    The Code of Civil Procedure, 1908 and Limitation Act, 1963.

3.4    Legal Language, Legal Writing including General English and Interpretation of Statutes.

3.5    Trust, Equity and Fiduciary Relationship

**Optional Paper: (Any One)**

3.6    (A)   Criminology and Penology

3.6    (B)   Intellectual Property Law

3.6    (C)   Law of Medicine

3.7    Land Laws

3.8    Human Rights and Practice

**Practical Papers:**

3.9    Arbitration, Conciliation and alternative Disputes Resolution System.

3.10    Drafting, Pleading, Conveyancing and Moot Court trial.


## COURSE CONTENTS

**Theories Paper (Compulsory and Optional Both)**

The syllabus has been divided into five units. Questions will be set from each unit .

The questions paper shall contain three sections. Section A shall contain 10 questions two from each unit of 2 marks each. The Candidate is required to answer all the questions. The answers should not exceed 50 words. Section B shall contain 5 questions one from each unit with internal choice each question shall be of 8 marks. The answers should not exceed 200 words. The candidate is required to answer all the questions. Section C shall contain 5 questions of 20 marks each, one from each unit. The candidate is required to answer any 2 questions. The answers shall not exceed 500 words.

In order to ensure that students do not leave out important portions of the syllabus, examiners shall be free to repeat the question set in the previous examination.

In the case of discrepancies between English and Hindi Version, English Version will prevail.

Acts are to be read with their Amendments

**Practical Paper:**

The syllabus has been divided into four units. Questions will be set from each unit.

The questions paper shall contain three sections. Section A shall contain 8questions two from each unit of 2.5 marks each. The Candidate is required to answer all the questions. The answers should not exceed 50 words. Section B shall contain 4 questions one from each unit with internal choice each question shall be of 10 marks. The answers should not exceed 200 words. The candidate is required to answer all the questions. Section C shall contain 4 questions of 20 marks each, one from each unit. The candidate is required to answer any 1question. The answers shall not exceed 500 words.

In order to ensure that students do not leave out important portions of the syllabus, examiners shall be free to repeat the question set in the previous examination.

In the case of discrepancies between English and Hindi Version, English Version will prevail.

Acts are to be read with their Amendments

## LL.B. I year
**Paper 1.1 Contracts-I (General Principles of Contract and Consumer Protection Act, 2019)**
**Max.Marks: 100**                                        **Min.Pass Marks: 36**

### UNIT-I

1. **General Principles of Law of Contract**

   History and nature of contractual obligations.

   Agreement and contract: definitions, elements, characteristics and kinds.

   Proposal and acceptance - various forms, essential elements, communication and revocation - proposal and invitation to proposal, floating offers, tenders.

   Consideration - need, meaning, kinds, essential elements - nudum pactum - Privity of contract and of consideration - its exceptions, adequacy of consideration, present, past and future consideration, unlawful consideration and its effects, views of Law Commission of India on consideration, evaluation of the doctrine of consideration.

### UNIT-II

**Capacity to Contract**: meaning - incapacity to contract - minor's Agreements-definition of 'minor', necessaries supplied to a minor, agreements beneficial and detrimental to a minor, affirmation-restitution in cases of minor's agreements, fraud by a minor, agreements made on behalf of a minor, minor's agreements and estoppels, evaluation of the law relating to minor's agreements.

**Consent -Free consent - Its need, definition and factors vitiating free consent.**

Coercion-definition, essential elements, duress and coercion Various illustrations of coercion, doctrine of economic duress, effect of coercion, Undue Influence-definition, essential elements, parties between whom such influence is presumed, where liability to prove the existence of undue influence, who is to prove it?, Illustrations of undue influence, independent advice,Pardahanashin women, unconscionable bargains, effect of undue influence, misrepresentation - definition, misrepresentation oflaw and of fact, their effects and illustration, Fraud-definition, essential elements-suggestions falsi-suppresioveri, when does silence amounts to fraud?, Active-concealment, importance of intention.

Mistake - definition, kinds, fundamental error, mistake of law and of fact, their effects, when does a mistake vitiate free consent and when does it not vitiate free consent?

## UNIT-III

**Legality of objects:**

Void and voidable agreements - void, voidable, illegal and unlawful agreements and their effects, Lawful and unlawful considerations and objects, Forbidden by law, Defeating the provision of any law, Fraudulent, Injurious to person or property, Immoral, against public policy,

Void Agreements - Agreements without consideration, Agreements in restraint of marriage, Agreements in restraint of trade, its exceptions - sale of goodwill, section 11 restrictions, exceptions under the partnership Act, trade combinations, exclusive dealing agreements, restraints on employees under agreements of service, Agreements in restraint of legal proceedings - its exceptions, Uncertain agreements, Wagering agreement - its exception.

**Discharge of a contract and its various modes.**

By performance-conditions of valid tender of performance How? By whom? Where? When? In what manner? Performance of reciprocal promises, time as essence of contract, By breach-anticipatory breach and present breach, Impossibility of performance - specific grounds of frustration-application to leases, theories of frustration, effect of frustration, frustration and restitution, By period of limitation, By agreement - rescission and alteration, their effect, remission and waiver of performance, extension of time - accord and satisfaction.

## UNIT-IV

**Quasi-contracts or certain relations resembling those created by contract**
**Remedies in contractual relations;**

Damages-kinds, remoteness of damages, ascertainment of damages, Injunction - when granted and when refused, Why? , Refund and restitution, Specific performance - When? Why?

**Government as a Contracting Party**

**Constitutional provisions:** government power to contract -procedural requirements.

**Standard Form Contracts**

**Nature, advantages:** Unilateral character, principles of protection against the possibility of exploitation, judicial approach to such contracts, exemption clauses, clash between two standard form contracts, Law Commission of India's views.

## UNIT-V

**Consumer Protection Act - 2019**

**Leading Cases**

- Carlil v. Carbolic Smoke Ball Company (1883) I.Q.B.256.
- Bhagwan Das v.Girdhari Lal & Company. AIR 1966. S.C.543.
- Lalman Sukha v.Gauri Dutt All. IJ (1913) 409.
- Mohri Bibi v.Dharmodas Ghose (1903) I.A.172.
- Indian Medical Association v.V.P. Shantha, AIR 1996 SC 500
- J.J. Merchant v.Shrinath Chaturvedi, AIR 2002 SC 2931

**Select Bibliography**

- Beatsen (ed.), Anson's Law of Contract (27th ed. 1998).
- P.S.Atiya, Introduction to the Law of Contract 1992 reprint(Claredon Law Series).
- Avtar Singh, Law of Contract (2000) Eastern, Lucknow.
- G.C.Cheshire, and H.S. Fifoot and M.P. Furmston, Law ofContract (1992) ELBS with Butterworths M.Krishnan Nair, Law of Contracts, (1998).
- G.H. Treitel, Law of Contract, Sweet & Maxwell (1997 Reprint).
- R.K. Abichandani, (ed.), Pollock and Mulla on the Indian Contract and theSpecific Relief Act (1999), Tripathi.
- Anson, Law of Contract (1998), Universal.
- Avtar Singh - Law of Contract.
- Gurbax Singh - Law of Consumer Protection.
- P. Leela Krishna - Consumer Protection & Legal Contract.
- Avtar Singh, Law of Consumer Protection.

## PAPER 1.2

### CONTRACT-II (SPECIFIC CONTRACTS, SALE OF GOODSACT, 1930, INDIAN PARTNERSHIP ACT, 1932 AND SPECIFIC RELIEF ACT, 1963)

**Max. Marks: 100**                                    **Min. Pass Marks: 36**

## UNIT- I

**Indemnity**

The concept, Need for indemnity to facilitate commercial transactions, Methods of creating indemnity obligations, Definition of Indemnity, Nature and extent of liability of the indemnifier, Commencement of liability ofthe indemnifier, Situations of various types of indemnity creations, Nature of indemnity clauses.

**Guarantee**

The concept, Definition of guarantee: as distinguished from Indemnity, Basic essentials for a valid guarantee contract, The place of consideration and the criteria for ascertaining the existence of consideration in guarantee contracts, Position of minor and validity of guarantee when minor is the principal debtor, creditor or surety, Continuing guarantee, Nature of surety's liability, Duration and termination of such liability, Illustrative situations of existence of continuing guarantee, Creation and identification of continuing guarantees, Letters of credit and bank guarantees as instances of guarantee transactions, Rights of surety, Position of surety in the eye of law, Various judicial interpretations to protect the surety, Co-surety and manner of sharing liabilities and rights, Extent of surety's liability, Discharge of surety's liability.

## UNIT- II

**Bailment**

Identification of bailment contracts in day today life, Manner of creation of such contracts, Commercial utility of bailment contracts, Definition of bailment, Kinds of bailees, Duties of Bailor and Bailee towards eachother, Rights of bailor and bailee, Finder of goods as a bailee, Liability towards the true owner, Obligation to keep the goods safe, Right to dispose off the goods.

**Pledge**

Pledge: comparison with bailment, Commercial utility of pledge transaction, Definition of pledge transactions, Definition of pledge under the Indian contract Act, Rights of the pawner and pawnee, Pawnee's right of sale as compared to that of an ordinary bailee, Pledge by certain specified persons mentioned in the Indian Contract Act.

## UNIT- III

**Agency**

Identification of different kinds of agency transactions in day to day life in the commercial world, Kinds of agents and agencies, Distinction between agent and servant, Essentials of a agency transaction, Various methods of creation of agency, Delegation, Duties and rights of agent, Scope and extent of agent's authority, Liability of the principal of acts of the agent including misconduct and tort of the agent, Liability of the agent towards the principal, Personal liability towards the parties, Methods of termination of agency contract, Liability of the principal and agent before and after such termination.

**Specific relief under Specific Relief Act, 1963**

Specific performance of contract, Contract that can be specifically enforced, Persons against whom specific enforcement can be ordered.

Rescission and cancellation, Injunction, Temporary, PerpetualDeclaratory orders

## UNIT- IV

**Sale of Goods**

Concept of sale as a contract, Illustrative instances of sale of goods and the nature of such contracts, Essentials of contract of sale, Essential conditions in every contract of sale, Implied terms in contract of sale, The rule of caveat emptor and the exceptions thereto under the Sale of Goods Act, Changing concept of caveat emptor, Effect and meaning of implied warranties in a sale, Transfer of title and passing of risk, Delivery of goods: various rules regarding delivery of goods, Unpaid seller and his rights, Remedies for breach of contract, Concept of nemo dat quad non habet with exceptions.

## UNIT- V

**Partnership**

Nature of partnership: definition, Distinct advantages and disadvantages vis-a-vis partnership and private limited company,Mutual relationship between partners, Authority of partners, Admission of partners, Outgoing of partners, Registration of Partnership, Dissolution of Partnership.

Limited Liability Partnership Act, 2008

**Leading Cases**

- National Bank of India Ltd. v.Sohan Lal, AIR 1962. Punjab534.
- Amrit Lal Gordhan Lallan v.State Bank of Travancore, AIR1960 S.C.1432.
- Patnaik & Company v.State of Orissa, AIR 1965 S.C. 1655.
- State of Gujarat v.Maman Mohd., AIR1967 S.C. 1885.

**Select bibliography**

- R.K. Abhichandani (ed.), Pollock and Mulla on Contracts and SpecificRelief Acts (1999) Tripathi, Bombay.
- Avtar Singh, Contract Act (2000), Eastern, Lucknow.
- Krishnan Nair, Law of Contract, (1999) Orient
- Avtar Singh, Principles of the Law of Sale of Goods and Hire Purchase (1998), Eastern, Lucknow.
- J.P. Verma (ed.), Singh and Gupta, The Law of Partnership in India (1999), Orient Law House, New Delhi.
- A.G.Guest (ed.), Benjamin's Sale of Goods (1992), Sweet & Maxwell.
- Beatson (ed.), Ansons' Law of Contract, (1998), Oxford, London.
- Saharay, h.k., Indian Partnership and Sale of Goods Act (2000), Universal
- Ramnainga, The Sales of Goods Act (1998), Universal
- Dasai S.T. The Law of Partnership in India and Pakistan
- Kapoor N.D. - Mercantile Law (Hindi & English).
- Banerjee, S.C., Law of Specific Relief (1998), Universal.
- Anand and Aiyer, Law of Specific Relief (1999), Universal.

# PAPER 1.3
## LAW OF TORTS AND MOTOR VECHICLE ACT

**Max. Marks: 100**                                        **Min. Pass Marks: 36**

### UNIT-I

**Evolution of Law of Torts**

England- forms of action - specific remedies from case to case, India - principles of justice equity and good conscience-uncodified character, advantages and disadvantages.

**Definition, Nature, Scope and Objects**

A wrongful act - violation of duty imposed by law, duty which is owed to people generally (in rem), damnum sine injuria and injuria sine damnum,Tort distinguished from crime, breach of contract and Quasi Contract, The concept of unliquidated damages, Changing scope of law of torts : expanding character of duties owned to people generally due to complexities of modern society, Objects - prescribing standards of human conduct, redressal of wrongs by payment of compensation, prescribing unlawful conduct by injunction.

**Principles of Liability in Torts**

Fault, Wrongful intent, negligence, Liability without fault, Violation of ethical codes, Statutory liability, Place of motive in torts.

### UNIT-II

**Justification in Tort**

Volenti non fit injuria, Necessity, private and public, Plaintiff's default, Act of God, Inevitable accident, Private defence, Statutory authority, Judicial and quasi-judicial acts, Parental and quasi-parental authority.

**Extinguishment of liability in certain situations**

Actio personalis moritur cum persona-exceptions, Waiver and acquiescence, Release, Accord and satisfaction, Limitation

**Standing**

Who may sue-aggrieved individual - class action - social action group, Statutes granting standing to certain persons or groups, who may not be sued?

**Doctrine of sovereign immunity and its relevance in India**

**Vicarious Liability**

Basic, scope and justification, Express authorization, Ratification, Abetment, Special relationships: Master and servant - arising out of and in the course of employment - who is master?- The control test, who is servant? - Borrowed servant, independent contractor and servant, distinguished - Principal and agent,Corporation and principal officer.

**Absolute/Strict liability**

The rule in Ryland's v. Fletcher,Liability for harm caused by inherently dangerous industries.

## UNIT-III

**Torts against persons and personal relations**

Assault, battery, mayhem,False imprisonment, Defamation - libel, slander including law relating to privileges, Marital relations, domestic relations, parental relations, master and servant relations, Malicious prosecution, Shortened expectation of life, Nervous shock.

**Wrongs affecting property**

Trespass to land, trespass ab initio, dispossession, movable property-trespass to goods, detinue, conversion, Torts against business interests- injurious falsehood, misstatements, passing off.

## UNIT-IV

**Negligence**

Basic concepts, Theories of negligence, Standards of care, duty to take care, carelessness, inadvertence,Doctrine of contributory negligence, Res ipsa loquitor and its importance in contemporary law, Liability due to negligence : different professionals,Liability of common carriers for negligence.

**Nuisance**

Definition, essentials and types, Acts which constitute nuisance obstructions of highway, pollution of air, water, noise, and interference with light and air.

## UNIT-V

**Legal remedies**

Legal remedies, Award of damages - simple, special, punitive, Remoteness of damage - foresee ability and directness, Injunction, Specific restriction of property, Extra-legal remedies - self help, re-entry on land, re-caption of goods, distress damage feasant and abetment of nuisance.

**Motor Vehicle Act 1988** as amended up to date and rules under the Act.

**Leading Cases**

- Ushaben v.Bhagya Laxmi Chitra Mandir. AIR 1970. GUJ. 18.
- Municipal Corpn. of Delhi v.Subhagwanti AIR 1966. S.C.page 1750.0
- Rylands v.Fletcher (1869) IR HT 330.
- Union Carbide Corporation v.Union of India, AIR 1992 SC248
- M.C. Mehta v.Union of India, AIR 1987 SC 965

**Select bibliography**

- Salmond and Heuston - On the Law of Torts (2000) Universal, Delhi.
- D.D. Basu, The Law of Torts (1982), Kamal, Calcutta.

- B.M. Gandhi, Law of Tort (1987), Eastern, Lucknow
- P.S. Achuthan Pillai, The law of Tort (1994) Eastern, Lucknow.
- Ratanlal & Dhirajlal, The Law of Torts (1997), Universal, Delhi.
- Jai Narayan Pandey- Law of Torts (Hindi)
- R.K. Bangia- Law of Torts (Hindi)
- N.M. Shukla- Law of Torts (Hindi)
- A.K. Dixit Law of Torts & Consumer Protection (Hindi)

## PAPER 1.4 Family Law-I (HINDU LAW)

**Max. Marks: 100**                                    **Min. Pass Marks: 36**

### UNIT-I

**Introduction -** Sources, Schools and application,Religious and Charitable Endowment - Essentials of an Endowment, Kinds, Shebait and Mahant

**Joint Family** - Mitakshara joint family, Mitakshara coparcenary-formation and incidents, Property under Mitakshara law - separate property and coparcenary property, Dayabhaga coparcenary - formation and incidents, Property under Dayabhaga law, Karta of the joint family - his position, powers, privileges and obligations, Alienation of property - separate and coparcenary, Debts - doctrines of pious obligations andantecedent debt, Partition and re-union, Joint Hindu family as a social security institution and impact of Hindu Gains of Learning Act and various tax laws on it, Matrilineal joint family.

### UNIT-II

**Customary practices and State regulation**

Conditions of Hindu Marriage, its ceremonies and Registrations, Void and Voidable marriage, Polygamy, Concubinage, Child marriage, Sati, Dowry

**Conversion and its effect on family**

Marriage, Adoption, Guardianship, Succession

**Matrimonial Remedies**

Non-judicial resolution of marital conflicts - (a) Customary dissolution of marriage-unilateral divorce, divorce by mutual consent and other modes of dissolution,Judicial resolution of maritil conflicts : the family court, Nullity of marriage, Option of puberty, Restitution of conjugal rights,Judicial separation, Desertion : a ground for matrimonial relief, Cruelty : a ground for matrimonial relief, Adultery : a ground for matrimonial relief, Other grounds for matrimonial relief, Divorce by mutual consent under: Hindu Marriage Act, 1955:Bar to matrimonial relief: Doctrine of strict proof, Taking advantage of one's own wrong or disability, Accessory,Connivance, Collusion, Condonation, Improper or unnecessary delay, Residuary clause - no other legal ground exists for refusing the matrimonial relief.

## UNIT-III

**Inheritance**

Historical perspective of traditional Hindu law as a background to the study of Hindu Succession Act, 1956,Succession to property of a Hindu male dying intestate under the provisions of Hindu Succession Act, 1956, Devolution of interest in Mitakshara coparcenary with reference to the provisions of Hindu Succession Act, 1956,Succession to property of Hindu Succession Act, 1956,Disqualification relating to succession, General rules of succession.

**The Hindu Succession Act, 1956:** Succession to the property of a Hindu male.Succession to interest in coparcenary property, property of a Hindu female,Succession to the property of a Hindu female, General rules and disqualifications ofsuccession, Escheat

## UNIT-IV

**Alimony and maintenance**

Maintenance of neglected wives, divorced wives, minor children, disabled children, and parents who are unable to support themselves; provisions under the code of Criminal Procedure, 1973, Alimony and maintenance as an independent remedy: a review under personal law, need for reforming the law, Alimony and maintenance as an ancillary relief.

**Child and the Family**

Legitimacy, Adoption, Custody, maintenance and education, Guardianship and parental rights - welfare of the child principle

**The Hindu Adoption and Maintenance Act, 1956:** Requisites of valid adoption,Capacity to take in adoption, capacity to give 'in' adoption, persons who may beadopted, other conditions for a valid adoption. Effects of adoption, Miscellaneousprovision of adoption.

**Maintenance** of wife, children and parents, Maintenance of widowed daughter-inlaw,Dependents and their maintenance. Amount of maintenance, miscellaneousprovisions of maintenance.

## UNIT-V

**The Hindu Minority and Guardianship Act, 1956:** Natural guardians and theirpowers. Testamentary guardians and their powers, de facto guardian generalprovisions of guardianship

**Partition:** Meaning, property for partition, persons entitled to claim partition andallotment of shares, partition how effected, Determination of Share, Reopening ofpartition. Re-union, Debts-Doctrine of pious obligation. Antecedent Debts

**Family and its changing patterns**

New emerging trends, Attenuation of family ties, Working women and their impact on spousal relationship: composition of family, status and role of women,New property concepts, such as skill and job as new forms of property,Factors affecting the family: demographic, environmental,religious and legislative processes of social change in India: sanskritization, westernization, secularization, universalization, parochialization, modernization, industrialization and urbanization.

**Settlement of spousal property**

Need for development of law

**Establishment of Family Courts**

Constitution, power and functions, Administration of gender justice

**Uniform Civil Code - need for**

Religious pluralism and its implications, Connotations of the directive contained in Article 44 of the Constitution, Impediments to the formulation of the Uniform Civil Code,The idea of Optional Uniform Civil Code.

**<u>Leading Cases</u>**

- Shastri Yagna Purushdasji v.Muldas, AIR 1966 S.C. 1153.
- Hanooman Prasad v.Mussamat Babooee Mandraj Kunwaree (1856) 6 M.I.A. 305.
- Gita Hariharan v.Reserve Bank of India, AIR 1999 S.C. 1149.
- Bipin Chander v.Prabhavati, AIR 1957 S.C. 176.
- Dr.N.G. Dastane v.Sucheta Dastane, AIR 1975 S.C. 1534.

**Select Bibliography**

- Paras Diwan, Law of Instestate and Testamentary Succession (1998), Universal.
- Basu, N.D., Law of Succession (2000), Universal.
- Kusem, Marriage and Divorce Law Manual (2000) Universal.
- Manchanda, S.C., Law and Practice of Divorce in India (2000) Universal.
- P.V.Kane, History of Dharmasastras Vol.2 pt.1 at 624-632 (1974).
- A.Kuppuswami (ed.) Mayne's Hindu Law and Usage Ch.4(1986).
- B.Sivaramayys, Inequalities and the Law, (1985).
- K.C.Daiya, "Population control through family planning in India,    "Indian    Journal of Legal Studies, 85 (1979).
- J.D.M. Derrett, Hindu Law : Past and Present.
- J.D.M. Derrett, Dealth of Marriage Law.
- J.D.M. Derret, A Critique of Modern Hindu Law, (1970).
- Paras Diwan, Hindu Law (1985).
- S.T.Desai (ed.) Mulla's Principles of Hindu Law, (1998) - Butterworths-India.
- Paras Diwan, Family Law: Law of Marriage and Divorce in India, (1984).
- A.M.Bhattachargee, Hindu Law and the Constitution (1994) Eastern Law House, Calcutta.

- Paras Diwan, Law of Adoption, Ministry, Guardianship and
  Custody (2000), Universal.
- Paras Deewan- Hindu Law (Hindi)
- U.P.D. Kesri- Hindu Law (Hindi

## PAPER 1.5. Family Law - II(Mohammedan Law)

**Max. Marks: 100**                                    **Min. Pass Marks: 36**

### UNIT-I

**Evolution and application of Law**

Origin, Development, Sources, Schools, Application, Interpretation, conversion

**Marriage**

Nature of marriage, Essentials of marriage, Khyar-ul-bulug, Iddat, Khilwat-us-sahih
Matrimonial Stipulations, Kinds of marriages, Effects of marriages

### UNIT-II

**Mahar (Dower)**

Meaning, Nature, Kinds of Dower, Objects of Dower, Subject matter of Dower
Wife's right on non-payment of dower.

**Dissolution of marriage**Historical background, Talaq, Various kinds of Talaq
Sec.2 of the Dissolution of Muslim Marriage Act, 1939, Legal Effect of Divorce.

### UNIT-III

**Pre-emption (Haq Shufa)**

Historical background of law, Meaning, Nature of Pre-emption, Classification of Pre-emption, Essential formalities.Right of Pre-emption when there is conflict of laws.Subject matter of pre-emption, Legal effect of pre-emption, Devices for evading pre-emption.

**Gift (Hiba)**

Meaning, Requisites of valid gift., Gift of musha, Conditional and future gift.
Life estate and life interest, Hiba-bil-ewaj, Hiba-ba-shart-ul-ewaj.

### UNIT-IV

**Will (Vasiyat)**Competency of testator and legatee., Valid subject of will., Testamentary limitation., Formalities of a will., Abatement of Legacy.

**Legitimacy and Acknowledgement**

Legitimacy and Legitimation, Presumption of Legitimacy under Muslim Law. Presumption of Legitimacy under Sec.112 of the Indian, Evidence Act. Conditions for valid acknowledgement.

**Maintenance**Meaning, Persons entitled to maintenance.Principles of maintenance.
Maintenance of Divorced Muslim woman under theMuslim woman (Protection of Right on Divorce) Act 1986 -acritical review.Death Bed Transactions , Meaning of Marz-ul-maut., Effect on Transactions during Marz-ul-maut.

## UNIT-V

**Waqf** Meaning of waqf., Essentials of waqf. Kinds of waqf, Beneficiaries of waqf. Formalities for creating waqf. , Waqf of musha. Administration of waqf. Mutawalli - Appointment, function, role, power, removal. Various muslim religious institutions. The waqf validating Act, 1913.

**Inheritance** General Principles of Law of inheritance., Classification of heirs under Hanafi and their shares and distribution of property.

**Leading cases**

13.1  Maina Bibi v.Choudhary Vakil Anmad (1925) 52 La.145.

13.2  Habibur Rahman v.Altaf Ali (1921) 481. A.114.

13.3  Monshee Bazul-ul-Raheem v.Luteefutoon - Nissa (1861)8 MIA. 379.

13.4  Abdul Fata v.Russmoy Chaudhary (1894) 2ZIA76.

13.5  Mohd. Ahmad Khan v.Shah Bano Begum AIR 1985 S.C. 945.

**Select Bibliography**

1.  Fyzee, Muhammedan Law.

2.  Mulla, Principles of Mohammedan Law.

3.  A.M. Bhattacharygee, Muslim Law and the constitution.

4.  Prof. B.L.Verma, Islamic law.

5.  Dr. D.S. Thalore, Muslim Law, UBH Jaipur

6.  Akil Ahamed - Muslim Law

## PAPER1.6
## CONSTITUTIONAL LAW OF INDIA- I

**Max. Marks: 100**                                     **Min. Pass Marks: 36**

### Unit -I

**Introductory** Making of Indian Constitution., Short Title, commencement of the constitution, authoritative text in the Hindi language, Nature and special features of the IndianConstitution. Challenges to Indian Federalism, Preamble, The Union & its territory Citizenship and state

**Fundamental Rights:(Article 12 to 18)** Concept ofFundamental Rights. Constitutional provisions relating to Fundamental rights. Articles 12 Definition of State, Article 13, Laws Inconsistent with Fundamental Right, Article 14 to 18 Right to Equality

### Unit -II

**Fundamental Rights: (Article 19 to 24)** Right to freedom Article 19-22, Right against exploitation Article 23, 24

**The Union Executive** The President Election, qualifications, salary and impeachment, Power: Legislative, Executive and dictionary power Constitutional

provisionand Vice-President of India, Council of Ministers. Prime Minister- Cabinet system- Collective responsibility, Coalition Government

## Unit -III

**Fundamental Rights: (Article 25 to 35)**Right to freedom of Religion Article 25-28, Cultural and Educational Rights Art 29, 30, Right to Constitution; Doctrine of Eclipse, Doctrine of waiver, Doctrine of severability.

**The Union Legislature** Lok Sabha, Rajya Sabha, Legislative process privileges of the parliament & state legislature, legislative privileges and fundamental rights.

**Judiciary under the Indian Constitution: Judicial independence The Union and State Judiciary -** The Supreme Court and High Courts.

## Unit -IV

**Services under the constitution -** Doctrine of Pleasure (Article 310), Protection against arbitrary dismissal, removal or reduction in rank (Article 311) and exceptions to Article 311., Public Service Commission of the Union and the states.

## Unit -V

**Emergency** Meaning and scope, National, State and Financial emergency.Proclamation of Emergency-conditions, effect of emergency on centre-staterelations. Emergency and suspension of fundamental rights

**Leading cases**

- Keshvanand Bharti v.State of Kerala, AIR 1973 S.C.1461
- Maneka Gandhi v.Union of India, AIR 1978 S.C. 597.
- Indra Sawhney v. Union of India, AIR 1993, S.C. 477.
- S.R.Bommai v.Union of India, AIR 1994, S.C. 1918.
- Vishaka v.State of Rajasthan, AIR 1997, S.C. 3014.

**Select Bibliography**

- D.D. Basu, Introduction of the constitution of India, Prentice Hall ofIndia, Delhi.
- H.M.Seervai, Constitution of India, Vol.1-3, Tripathi, Bombay.
- V.N.Shukla, Constitutional law of India, Oxford.
- G.Austin, Indian Constitution : Cornerstone of a Nation.
- M.P. Jain, Indian Constitutional Law, Wadhwa and Company Nagpur.
- Kagzi, The Constitution of India, India Law House, N.Delhi.
- G.N.Pandey- Constitution of India (Hindi)

## PAPER1.7
## CONSTITUTIONAL LAW OF INDIA- II

**Max. Marks: 100**                                    **Min. Pass Marks: 36**

### Unit –I

**Directive Principles of Stateand Fundamental Duties –(Article 36 to 51A)**
Directive Principles - directions for social change -A new social order,Inter-relationship between fundamental rights and directive principles, Fundamental Duties – The need and status in constitutional set-up.

### Unit –II

**The State Executive:**The Governor, The Council of Ministers, Relationship betweenthe Governor and the Council of Ministers.
**The State Legislature:**Vidhan Sabha, Vidhan Parishad.The Panchyats, The Municipalities

### Unit –III

**Union and State Relationship:**Legislative relationship, Administrative relationshipFinancial relationship.
**Subordinate Judiciary Judges**: appointment, removal, transfer and condition of servicesJudicial review – nature and scope.

### Unit –IV

**State liability in contracts andTorts:** Suits by and against the state. Property Rights (Article 300-A). Freedom of Trade, Commerce and Intercourse
**Writes:** Habeas Corpos, Certiorari, Mandamus, Quo Warranto, Prohibition

### Unit -V

**The Amendment of the Constitution:**Necessity of Amending provisions in the constitution; Procedure for Amendment. Amendments of fundamental rights. Judicial review of amendment and the theory of Basic Structure.
Temporary provision with respect of the state of J&K.

**Leading cases**

Keshvanand Bharti v.State of Kerala, AIR 1973 S.C.1461
Maneka Gandhi v.Union of India, AIR 1978 S.C. 597.
Indra Sawhney v.Union of India, AIR 1993, S.C. 477.
S.R.Bommai v. Union of India, AIR 1994, S.C. 1918.
Vishaka v.State of Rajasthan, AIR 1997, S.C. 3014.

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- H.M.Seervai, Constitution of India, Vol.1-3, Tripathi, Bombay.
- V.N.Shukla, Constitutional law of India, Oxford.
- G.Austin, Indian Constitution : Cornerstone of a Nation.
- M.P. Jain, Indian Constitutional Law, Wadhwa and Company, Nagpur.

- Kagzi, The Constitution of India, India Law House, N.Delhi.
- J.N.Pandey- Constitution of India (English)

## PAPER 1.8 ENVIRONMENTAL LAW

**Max. Marks: 100**                                    **Min. Pass Marks: 36**

### UNIT-I

**Concept of Environment and Pollution -**Meaning and contents of environment, Meaning and contents of pollution, Kinds of pollution, Effects of pollution

**Legal Control: Historical Perspective -**Indian tradition: Dharma of environment, British Raj - Industrial development and exploitation of natureNuisance - Penal code and procedural codesEnvironmental Concerns in Modern India

### UNIT-II

**Constitutional Protection to environment -**Constitution making - development and property oriented approachFundamental Rights and Environment-Rights to clean and healthy environment, environment v.development.Directive principles of state policy and environmentFundamental Duties and environment.Other provisions of the constitution relevant to environmentEmerging Principles - polluter pays precautionary principle, public trust doctrine and sustainable development. Public Interest Litigation Judicial Activism Pertaining to Environmental Pollution.

### UNIT-III

**The Water (Prevention and Control of Pollution) Act, 1974**Application of the Act, DefinitionsConstitution of central, state and joint boardsPowers and functions of the Board , Qualification and disqualification of the membersPrevention and control of water pollution and procedure thereof , Funds, account and auditPenalties

**The Air (Prevention and Control of pollution) Act, 1981**Application of the Act, DefinitionsConstitutions of central, State and joint boardsPowers and functions of the Board , Qualifications and disqualifications of the membersPrevention and control of Air pollution and procedure thereof , Funds, account and auditPenalties

### UNIT-IV

**Environment Protection Act, 1986**Application of the Act, Definitions, General Powers of the central government including the powers to give directionsPrevention and control of environmental pollutions and procedure thereofPenalties

### UNIT-V

**Noise Pollution**Meaning of Noise pollution, Sources of Noise pollution, Effects of Noise pollution, Legal Control

**Forests and wild life protection**

**The Indian Forests Act, 1927** - Salient features of the Act, Applicability, Power to reserve forests, power to declare forests land, powers and functions of forest settlement officer, protected forests, penalties and contraventions.

**The Forest (conservation) Act, 1980**: Objectives, application and salient features of the Act, definitions, Restrictions on the de-reservation of forests, advisory committee, offences and penalties.

**Wild life (Protection) Act, 1972 -** Objectives, applicability and salient features of the Act, Authorities, Duties of wild life Advisory Board, Hunting of wild animals, sanctuaries, National Park, Closed areas, central Zoo authority, Trade or commerce in wild animals, Animal articles and trophies, Prevention and detection of offences, penalties.

**International Regime**UN declaration on right to development, Stockholm, Rio etc. conferences.Green House effect and Ozone depletionBio-diversity.

**Leading Cases**
- M.C. Mehta v.Union of India, AIR 1987 SC 965
- M.C. Mehta v.Union of India, AIR 1988 SC 1115
- Vellore citizen's welfare forum v.Union of India, AIR 1996 SC 2715
- Tarun Bharat Sangh, Alwar v.Union of India, AIR 1992 SC514
- A.P. Pollution control Board (II) V/s Prof. M.V. Nayudu, (2001) 2 SCC 62.

**Select Bibliography**
- Aarmin Rosencraz, Environmental Law and policy in India, Oxford.
- R.B. Singh & Suresh Mishra, Environmental Law in India,Concept Publishing Co., New Delhi.
- Kailash Thakur, Environmental Protection Law and policy in India, Deep & Deep publications, New Delhi.
- Leela Krishan, P, Law and Environment, Eastern, Lucknow
- S.C. Shastri, Environmental Law, Eastern, Lucknow
- S. Shantha Kumar, Introduction to Environmental Law, Wadhwa,Nagpur
- Dr. C.P. Singh, Environmental Law (Hindi)
- Satish Shastri, Noise Pollution (Hindi)
- Aniurdh Prasad - Environmental Law (Hindi)
- Dr. S.K. Saini and Dr. Surendra Singh - Environmental Law (Hindi)

## PAPER 1.9 (A) LEGAL AND CONSTITUTIONAL HISTORY

**Max. Marks: 100**                                    **Min. Pass Marks: 36**

### Legal History of India
### UNIT-I

**Judicial Systems in Ancient India**Judicial system in ancient India : Hindu period, Ancient Hindu social order and religions philosophy, Administration of justice, Judicial system in medieval India: Muslim period, The Mughal period : judicial system.

**Administration of Justice in Bombay, Madras and Calcutta**Emergence of the East India Company: development of authority under charters, Trading body to a territorial power : subsequent charters, Administration of justice in Madras from 1639 to 1726, Administration of justice in Bombay 1668-1726, Administration of justice in Calcutta 1619-1726.

**The Mayors Court**Genesis of the Charter of 1726, Provisions of the charter, working in judicial system, Charter of 1753, Defects of judicial systems.

## UNIT- II

**Adalat System**Grant of Diwani, Execution of Diwani Functions, Judicial plan of 1772, Defects of the plan, New Plan of 1774, Reorganization of adalats in 1780, Reforms of 1781, The first civil code, Reforms in the administrations of criminal justice.

**The Regulating Act 1773**Charter of 1774 and the Supreme Court of Calcutta, Some land mark cases: Issue of Raja Nandkumar (1775) : whether a judicial murder?, The Patna cases (1777-79), The Cossijurah case (1779-80), Act of settlement 1781, Major defects, Supreme Courts at Calcutta, Madras and Bombay, Law and administration in the Supreme Court.

## UNIT- III

**Judicial Reforms**Judicial reforms of Cornwallis, Problems of judicial reforms 1793 1833, Impact of reforms by Cornwallis 1793, Reforms of Sir John Shore (1793) Reforms of Lord Wellesley (1798), Reforms of Lord Cornwallis (1805), Reforms of Lord Minto (1807), Lord Hastings' administration of justice (1813), Judicial reforms of Lord Bentick (1828), Defects of the systems.

**Growth of Criminal Law.**

**Growth of personal Law of Hindus and Muslims.**

**Charter Act 1833.**

**Growth of Justice, equity and good conscience.**

## UNIT- IV

**Establishment of the High Courts**

The Indian High Courts Act 1861The Government of India Act 1915: other High Courts, Jurisdiction of high courts, Posts constitutional developments.

**The Indian Councils Act 1909,**

**The Government of India Act 1919,**

## UNIT- V

**The Federal Court of India** Foundation of the Federal Court, Jurisdiction, Authority of law, Expansion of jurisdiction, Abolition of the Federal Court, Anassessment.

**Privy Council**Jurisdiction, Appeals from India, A unique institution.

**The Supreme Court of India**Origin, Constitution, Jurisdiction and powers, Doctrine of precedents and the Supreme Court, Recent Changes.

**Influence of English Law in India**

**Prerogative writs in India**

**Racial discrimination**

**The Simon Commission and developments up to 1935,**

**The Government of India Act 1935,**

**The Cripps Mission,**

**The Cabinet Mission,**

**The Indian Independence Act 1947**

**Leading Cases -**

    (i)    Raja Nand Kumar case.

    (ii)   The Cossijurah Case

    (iii)  The Patna Case

    (iv)  Kamaluddeen Case

**Select Bibliography**

-    Courtney llbert, Government of India (1962)
-    Courtney llbert, The mechanics of Law Making (1914)
-    M.P. Jain, Constitutional Law of India (1987) Tripathi, Bombay
-    M.P. Jain, Outlines of Legal History (1998), Tripathi
-    M. Rama Jois, Legal and constitutional History of India (1984)(Two volumes)
-    A.B. Keith, Constitutional History of India 1600-1936 (1936)
-    A.C.Banerjee - The making of Indian Constitution.
-    Rankin, G.C. Background to Indian Law (1946)
-    V.D. Mahajan - Constitutional History of India.
-    V.D. Kulshreshtha, Landmarks in Indian Legal History (1992),
    Eastern Lukhnow.
-    B.S. Sinha - Legal and Constitutional History
-    Eric Stakes, The English Utilitarian's and India (1992), Oxford, Delhi.

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**PAPER1.9 (B) Rajasthan Local Laws**

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**Max.Marks: 100**                           **Min.Pass Marks: 36**

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**UNIT- I**

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   **Rajasthan Panchayati Raj. Act, 1994**Institution, Development, Basic and Wardsabha, Gram Sabha, Panchyatiraj.

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**UNIT- II**

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   **Rajasthan Municipalities Act, 2009**

   **Historical Background, Definitions, Constitution, Election (Sections - 1-37)**

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**UNIT- III**

</div>

**Rajasthan Municipalities Act, 2009** Recognition, Removal etc.Etc. (Sections 38-344)

### UNIT-IV

**Rajasthan Right to Hearing Act, 2012** Introduction, Complaint, Appeal, Revision etc. Institutions, Power of Sate Govt. Misc.

### UNIT-V

**Rajasthan Guaranteed Delivery of Public Service Act, 2011** Background, Development, Appeal, Revision, Providing Service Penalty Action in Good Faith.

## PAPER1.9 (C) Criminal Minor Acts

### UNIT-I

Narcotics Drugs Psychotropic Substance Act, 1985- Historical Background, Contribution Purpose, Preliminary, Authorities and officers, National Fund for Control of Drug Abuse, Prohibition, Control and Regulation, Offences and Penalties, Procedure, Forfeiture of Property etc. Punishment.

### UNIT-II

SC/ST (Prevention of Atrocities Act, 1989)Preliminary, Historical Background, Role, Purpose, Offenders, Victims, Offences, Punishments etc. Special Courts, Investigation, Rehabilitation.

### UNIT-III

Protection of Child from Sexual Offences Act, 2012 – Historical Background, Purpose, Preliminary, Sexual Offences against children,using child for pornographic Purposes and Punishment, Abetment of an Attempt to commit offence, Procedure for Reporting, Procedures for Recording Statement of the Child, Special courts, Procedure and powers, Miscellaneous.

### UNIT-IV

I.T. Act., 2000 (A): Special Emphasis on Cyber Crimes. Historical Background, Preliminary Digital Signature, Attribution, Acknowledgement, Dispatch of Electronic Records, Secure Electronic, records and digital signatures, Regulations of Certifying Authorities.

### UNIT-V

I.T. Act., 2000 (B): Digital Signature certificates, Duties of Subscribers, penalties and Adjudication, Cyber Regulations Appellate Tribunal, Offences, Network service providers not to be liable in certain case, Miscellaneous cyber crimes

## PAPER 1.10 PROFESSIONAL ETHICS, LAWYER'SACCOUNTABILITY AND BAR - BENCH RELATIONS.

This paper will consist of following two parts –

**Written Paper: 80 marks**                         **Min. Pass Marks: 29**

**Practical Exam.: 20 marks**                     **Min. Pass Marks: 07**

The Practical examination shall be conducted by a committee of 2 examiners. In this committee there shall be one internal and one external examiner. The students have to clear the written paper as well as Viva Voce separately, i.e i.e. 29 in marks in the written and 7 marks in the viva voceare necessary.

## UNIT-I

**Basic Postulates of Administration of Justice:**Image of justice,Wheels of the chariot of justice,Bench-Judges in the image of justice, Bar-Act, Plead and Dress of Advocate.

**Historical Evolution of Legal Profession:**Legal Profession in Ancient India,Position of Legal Profession in Muslim Regime,Legal Profession during the British Regime.

**Autonomy of Legal Profession**Indian Bar Committee, 1923 , Indian Bar Council Act, 1926 , All India Bar Committee, 1951, Unified Bar - The necessity of time., 14th Report of the Law Commission., Advocates Act, 1961., Provisions which strengthen Unified Bar., Organization of Bar on All India Basis, Constitution of Bar Council and Elections., Admission and Disciplinary action., Regulation of Legal Education.

**Image/Position of Legal Profession in Society**Advocacy is a profession not a business, Legal profession is a noble profession, Deterioration in Image of Legal Profession in IndependentIndia,Role of Lawyers in Society.

## UNIT-II

**The necessity of the Professional Ethics:**The Art of Advocacy, Professional Ethics,Nature of Professional Ethics and the problems of the code of Ethics,Advantages of having codified professional ethics,Professional Ethics - Rules of Conducts.

**Bar-Bench Relationship**General Conception., Advocates duty to the Court, Duty of Judge towards the Advocate, Duty of the Bar towards the Bench,Grounds of disputes in Bar-Bench Relations,Suggestions to improve Bar-Bench Relations.

## UNIT-III

**Relationship between an Advocate and his client:**Code of conduct, Lawyers-client Relationship,Do's and Don'ts for advocate towards client.

**Accountability of lawyers**

**Professional Ethics and Advocates Duties to colleagues and others**: Advocates duty to colleagues, advocates duty to opponents,advocates duty towards witnesses andadvocates duty to public,illustrations of other misconduct,disciplinary committee's approach in case of professionalor other misconduct.

## UNIT-IV

**Contempt of Court**

Purpose and meaning of contempt of court., Contempt of Court by Judge, lawyers and state., Contempt by Judge, Magistrate or other persons acting judicially.Contempt of Court by Advocates.Contempt of Court by State, Corporate bodiesand their officers.Punishment - Nature and Extent.Power of Superior Courts in Contempt cases.Safeguards available in contempt cases.

**Authorities and Procedures to deal with professional, misconduct and remedies against their order.**

State Bar Council and its disciplinary committee.

The Bar Council of India and its disciplinary committee.

Remedies against the order of punishment.

Quantum of punishment.

**Leading Cases**
1.  In Re Vinay Chandra Mishra.
2.  Hikmat Ali Khan v.Ishwar Prasad Arya & others 1997,3SCC 1608
3.  P.D. Gupta v.Ram Murti and another. 7 S.C.C. 147 AIR 1998S.C.283.
4.  D.S. Dalal v.State Bank of India and others. AIR 1993 S.C. 1608.
5.  Delhi Judicial Services Association, Tis Hazari Court v.State of Gujrat, AIR 1991 S.C. 2176.

**Select Bibliography**
1.  The Bar Council Code of Ethics.
2.  The contempt of Court Act.
3.  Dr.Anirudh Prasad, Principles of the Ethics of Legal Profession in India.
4.  Mamta Rao, Professional Ethics.
5.  Raju Ramachandran, Professional Ethics : Changing profession, changing ethics, Butter worths, New Delhi.
6.  Dr. Murlidhar Chaturvedi- Proffessional Ethics, Accountabiligy of Lawyers and bench (Hindi)

**Practical Exam:**

The candidate shall be required to submit in writing the facts,arguments and the principles of law laid down in any two important decisions of the Supreme Court and disciplinary committee of Bar Council of India. The division of marks will be as under :

(1) Record submitted by the student                10 marks

(2) Viva-voce                                        10 marks

The Viva-voce examination shall be conducted by a committee of 2 persons. In this committee there shall be one internal and one external examiner.

# LL.B. SECOND YEAR EXAMINATION
## COURSE CONTENTS

**Note : Theories Paper (Compulsory and Optional Both)**

The syllabus has been divided into five units. Questions will be set from each unit .

    The questions paper shall contain three section. Section A shall contain 10 questions two from each unit of 2 marks each. The Candidate is required to answer all the questions. The answers should not exceed 50 words. Section B shall contain 5 questions one from each unit with internal choice each question shall be of 8 marks. The answers should not exceed 200 words. The candidate is required to answer all the questions. Section C shall contain 5 questions of 20 marks each, one from each unit. The candidate is required to answer any 2questions. The answers shall not exceed 500 words.

    In order to ensure that students do not leave out important portions of the syllabus, examiners shall be free to repeat the question set in the previous examination.

    In the case of discrepancies between English and Hindi Version, English Version will prevail.

    Acts are to be read with their Amendments

**Practical Paper:**

    The syllabus has been divided into four units. Questions will be set from each unit.

    The questions paper shall contain three sections. Section A shall contain 8 questions two from each unit of 2.5 marks each. The Candidate is required to answer all the questions. The answers should not exceed 50 words. Section B shall contain 4 questions one from each unit with internal choice each question shall be of 10 marks. The answers should not exceed 200 words. The candidate is required to answer all the questions. Section C shall contain 4 questions of 20 marks each, one from each unit. The candidate is required to answer any 1 question. The answers shall not exceed 500 words.

    In order to ensure that students do not leave out important portions of the syllabus, examiners shall be free to repeat the question set in the previous examination.

In the case of discrepancies between English and Hindi Version, English Version will prevail.

    Acts are to be read with their Amendments.

## PAPER - 2.1 JURISPRUDENCE

**Max. Marks: 100**                              **Min. Pass Marks: 36**

### UNIT- I

**Introduction:** Meaning, definition, nature, scope and importance of Jurisprudence.

**Norms and the normative system:** Different types of normative systems, such as of games, language, religious orders, unions, clubs and customary practice. Legal

systems as a normative order: similarities and difference of the legal system with other normative systems.Law: Nature and definition given by different jurists.

## UNIT- II

**Schools of Jurisprudence:**Analytical positivism, Natural Law School, Historical School, Sociological SchoolEconomic Interpretation of Law, Realist School.

**The Indian Jurisprudence:** Origin and its nature, the concept of 'Dharma'

## UNIT- III

**Purpose of Law:** Justice, meaning and kinds, Justice and law: Approaches of different schools; Power of the Supreme Court of India to render complete Justice in a case with special reference to Article 142. Critical studies, Feminist Jurisprudence.

**Sources of Law:** Customs, legislations, judicial precedent and Juristic writings as a source of law. Concept of Stare decisis, obiter dicta and Ratio decedendi.

## UNIT- IV

**Persons:** Nature of personality, status of the unborn, minor, lunatic, drunken, dead person, idol and mosque; corporate personality- Corporate sole and corporate aggregate; dimensions of the modern legal personality of non-human beings.

**Possession:** Concept and kinds of possession.

**Ownership:** The concept, kinds. Relation between possession and ownership.

## UNIT- V

**Concept of legal rights**, its kinds and right-duty correlation.

**Title**

**Property:** Concept and kinds of property.

**Liability:** Conditions required for imposing liability, wrongful act-damnum sine injuria and injuria sine damnum, Causation, mensrea, intention, motive, Malice, negligence and recklessness, Strict and vicarious liability.

**Obligation:** nature, kinds and sources of obligation.

**Procedure:** difference between substantive and procedural laws. Evidence-nature and kinds,Theory of Punishment, Administration of Justice, Capital Punishment

**Leading Cases**
1. Keshavanand Bharti v. State of Kerala, AIR 1973 SC 1461 (Per Mathew J.) - Paras 1617-1620 (Sovereignty) 1685-1698 (Natural Law and Natural rights) 1726-1729 (Roscoe pound and Sociological Jurisprudence) 1738-1751 (Property rights and Social Justice).
2. A.K. Gopalan v. State of Madras, AIR 1950 SC 27 (S.970 paras 18, 19 Per Kania C.J.) Paras 107-109(Per Patanjali Shastri) Para 192 (Per Mukherji J.) Paras 228 (Per Das J. Natural Law and Positive Law)
3. Maharaja Shree Ummed Mills Ltd v. Union of India, AIR 1963 SC 953 Paras 12, 13, 14 (Per SK. Das J.) Concept of Law; Legislative agreements)

4. Jaipur Udyog Ltd v. Income Tax Commissioner, AIR 1965 Raj 162 Paras 12, 13, 14 (Per Tyagi J.) (Sovereignty, Separation of powers and functions).
5. Shrimati Indira Nehru Gandhi v. Raj Narayan, AIR 1975 SC 2299 Paras 219 and 299 (Per Mathew J.) (generally as a property of law.)
6. In Re Article 143 (Keshav Singh) AIR 1965 SC 745 paras 9-17 (Per sarkar J. Law making by judicial and legislative comity).
7. Bengal Immunity Co. v. State of Bihar, AIR 1955 SC 661 (Precedent)
8. Trilokchand Motichand v.H.B Munshi AIR 1970 SC 898 (Para 4 to 11, per Hidayatulla CJ.) Para 36 per Bhachawat J.; Para 59-63 per hegde J.). These excerpt illustrate problems and uses of Hohfeld analysis.
9. Menka Gandhi v. Union of India, AIR 1978 SC 597

**Bibliography**

1. Salmond: Jurisprudence
2. Dias: Jurisprudence
3. Wayne Morrison: Jurisprudence
4. Julius stone: The province and function of Law
5. Holland: Jurisprudence
6. S.N. Dhyani: Jurisprudence- A study of Indian Legal Theory
7. N.V. Paranjape: Vidhi Shastra
8. V.D. Mahajan, Jurisprudence and Legal theory
9. Bodenheimer Jurisprudence- The Philosophy and method of law.
10. Mulla- Hindu Law
11. Mani Tripati- Jurisprudence (Hindi)

## PAPER - 2.2 LAW OF CRIMES

**Max. Marks: 100**                                    **Min. Pass Marks: 36**

### UNIT- I

**General Introduction-** Concept of crime: Its definition, nature and scope. Distinction between crime and other wrongs. Applicability of IPC: Intra and Extra territorial operation. Salient features of the IPC, general explanations.

**Elements of criminal liability:** Mental elements in crime- mensrea (evil intention), its importance and exceptions. (Trends to fix liability without mensrea). State's power to determine acts or omissions as crime.

**Types of Punishment-** Death punishment, its impacts and social relevance. Alternative to capital punishment; imprisonment for life with hard labour, simple imprisonment; Forfeiture of property and fine. Discretion of Court in awarding punishment. Minimum punishment in respect of certain offences.

**Stages of a crime-** mere intention not punishable, preparation, attempt- tests for determining what constitutes attempt- proximity, equivocality and social danger, impossible attempts.

## UNIT-II

**General Exceptions:** Factors negative guilty intention: Mistake of fact not of law; judicial act, accident, necessity, minority and insanity; (Impairment of cognitive faculties, emotional imbalance) medical and legal insanity; Intoxication. Private defence-justification and limits when private defence extends to causing of death to protect body and property.

## UNIT-III

**Group Liability:** Common intention, unlawful assembly and common object. Abetment: instigation, aiding and conspiracy. Mere act of abetment punishable. Provisions relating to criminal conspiracy. Riot and affray.

**Offences against the state:** waging war against the state and sedition.

**Offences against public servant and public justice**: Contempt of lawful authority of public servants; giving and fabricating false evidence and aggravated form of the crime.

## UNIT-IV

**Specific offences against Human Body:**

(i) Culpable homicide, murder, distinction between culpable
homicide and murder. Situation justifying treating murder as culpable homicide not amounting to murder-grave and sudden provocation, exceeding right of private defence, public servant exceeding legitimate use of force, death in sudden fight, death caused by consent of the deceased- euthanasia and surgical operation. Death caused of person other than the person intended. Rash and negligent act causing death.

(ii) Hurt- simple and grievous

(iii) Wrongful restraint and wrongful confinement

(iv) Criminal force and assault

(v) Kidnapping and abduction.

**Offences against women:-**

(i) Insulting the modesty of a woman, assault or criminal forcewith intent to outrage the modesty of a woman.

(ii) Miscarriage: Causing miscarriage without women's consent and causing death by miscarriage without women's consent.

(iii) Kidnapping or abducting woman to compel her to marry or force her to illicit intercourse.

(iv) Buying or selling a minor for purposes of prostitution.

(v) Rape- custodial rape, gang rape, marital rape, unlawful sexual intercourse.

(vi)    Prevention of immoral traffic and prevention of sati

(vii)   Cruelty by husband or his relative

(viii)  Dowry death

(ix)    Prohibition of indecent representation of women

**Protection of Women from Domestic Violence Act, 2005-** Definitions, Power and duties of protection of officers and service providers, Application to Magistrate, Protection orders, Residence orders, Custody orders, Compensation orders and Monetary reliefs, Penalty for breach of protection orders by respondent.

## UNIT-V

**Offences against property-** theft, extortion, robbery, dacoity, criminal misappropriation of property, criminal breach of trust, cheating, mischief and criminal trespass

**Offences relating to documents:** Forgery or making a forged document

**Offences relating to marriage:** Bigamy, marriage or fraudulently gone through without lawful marriage, adultery, enticing or deceiting a married woman.

**Defamation:** definition and exceptions

**Leading cases:**

1    Reg v. Govinda IR 1876 1 BOM 342.

2    Kedarnath v. State of Bihar AIR 1962 SC 955

3    T.D. Vadgama v.State of Gujrat AIR 1973 SC 2313

4    Veliji Ragahvji v.State of Maharashtra AIR 1965 SC 1433

5    K.N. Nanavati v.State of Maharashtra AIR 1962 SC 605

**Select Bibliography**

1    Dr. Hari Singh Gour- Penal law of India

2    Rattan Lal and Dhirajlal: The Indian Penal Code

3    P.S. Achuthan Pillai: Criminal law

4    B.M. Gandhi: Indian Penal Code

5    Prof. K.S.N. Murty & KVS Sarve: Criminal Law

6    T. Bhattacharya: Bhartiya Dand Sanhita

7.   Rajat Bajal: Law of Protectionof Women from Domestic Violence

## PAPER - 2.3 PROPERTY LAW INCLUDING TRANSFER OF PROPERTY ACT AND EASEMENT ACT

**Max. Marks: 100**                        **Min. Pass Marks: 36**

### UNIT-I

**Jurisprudential control of property:** Concept, meaning and kinds of property: Movable and immovable, tangible and intangible property. Intellectual property: copyright, patents, designs and trademarks.

**Preliminary:** Definition, Essentials of Transfer, Competence of parties, subject matter of transfer, transfer to unborn child, registration of transfer, etc.

**General Rules of Transfer:** (a) Restrains of alienation absolute or partial, Restrains of free enjoyment, Covenants affecting enjoyment, divesting on insolvency, perpetuities, Future estates, Doctrine of acceleration.

Accumulation of income, exceptions, Covenants and Transfer. General Rules of Transfer (b) Conditional transfer: Condition precedent, condition subsequent; vested and contingent interest.

## UNIT-II

Election, Priority of rights, Notice, Implied transfers by limited owners, transfer of property out of which maintenance claims have to be met, ownership by holding out, ownership by estoppels, feeding the grant by estoppels. Doctrine of Part performance (Ss. 35-53 A) Sale of immovable property (Ss. 54 to 57).

## UNIT - III

Mortgage and Charge: Kinds of mortgage, Rights and liabilities of Mortgagor and mortgagee, Priority, marshalling, contribution and subrogation.

## UNIT – IV

Exchange, Lease, Gift, Actionable Claims.

## UNIT – V

**Easements:** Indian Easements Act, 1882, Nature, Characteristics, Creation. Essentials of Easements, Imposition, Acquisition, Incidents, Disturbance, Extinction, Suspension and Revival of Easement, Riparian Rights, License, Difference between lease and license.

**Leading cases:**
1    Smt. Shanta Bai v.State of Bombay & Others, AIR 1958 SC 532
2    Rajender v.Santa Singh, AIR 1973 SC 2537
3    Kreglinger v.New Patagonia Meat and Cold Storage Comp. Ltd (1914) AC 25
4    Union of India v.Sharda Mills Ltd, AIR 1973 SC 281
5    Nathu Lal v.Phool Chand, AIR 1970 SC 546
6    Jumma Masjid v.Deviah AIR 1962 SC 847

**Select Bibliography**
1    Mulla: Transfer of Property Act
2    S. Shah: Lectures on Transfer of Property
3    Vepa P Sarathi: Law of Transfer of Property
4    I.C. Saxena: Transfer of Property
5    B.B. Mitra: Transfer of Property
6    S.R. Bhansali and Sharma: Sampathi Antaran Adhiniyam
7    J.N. Kulshrestha: Sampathi Antaran Adhiniyam
8    S.N. Shukla: Sampathi Antaran Adhiniyam

9       G.P. Tripathi: Sampathi Antaran Adhiniyam
10      Dr. R.R. Gupta: Sampathi Antaran Adhiniyam and Sukhadhikar

## PAPER - 2.4 COMPANY LAW

**Max. Marks: 100**                                    **Min. Pass Marks: 36**

### UNIT- I

**General Introduction:** Theories of corporate personality, creation and extinction of corporations. Corporations, partnerships and other associations of persons, state corporations, government companies, small scale; cooperative, corporate and joint sectors. Holding and subsidiary companies. Public and private company.

**Law relating to Public and Private Companies:**Companies Act 2013
Need of company for development, Kinds of Company, formation, registration and incorporation of a company.

### UNIT- II

**Memorandum of association:** various clauses, alteration there in- doctrine of ultra vires

**Articles of association:** binding force- alteration- its relation with memorandum of association-doctrine of constructive notice and indoor management and exceptions. Promoters-position-duties and liabilities.

### UNIT-III

**Prospectus:** issue, contents, liability for misstatements, statement in lieu of prospectus

**Shares:**general principles of allotment, statutory restrictions, share certificate- its objects and effects, transfer of shares, procedure for transfer, issue of shares at premium and discount, depository receipts-dematerialized shares (DEMAT). Calls on shares, forfeiture and surrender of shares; lien on shares

**Share capital:** kinds, alteration and reduction of share capital, further issue of capital, conversion of loans and debentures into capital.

**Borrowing powers:** charges, mortgages, contract by companies, debenture- meaning, kinds and remedies available to debenture holders.

### UNIT-IV

**Directors:** position, appointment, qualification, vacation of office, removal, resignation, powers and duties of directors. Managing directors and other managerial personnel.

**Meetings:** kinds, procedure and voting.

**Audit and accounts**

**Dividends:** payment, capitalization and profit.

**Protection of minority rights**

**Protection of oppression and mismanagement:** who can apply? Powers of the court, company and the central government, Investigation of company affairs.

**Reconstruction and amalgamation of company**

## UNIT-V

**Winding up of Company:**Winding up-types: By court-grounds-who can apply? Procedure-powers of liquidator-powers of court, consequences of winding up. Voluntary winding up by members and creditors, winding up subject to supervision of courts, payment of liabilities, winding up of unregistered company.

**Law and multinational companies-**
    (i)    International norms for control
    (ii)    Foreign exchange management Act, 1999- Joint ventures investment in India, repatriation of project.
    (iii)    Collaboration agreements for technology transfer.

**Corporate liability:**
    (i)    Legal liability of companies- civil and criminal
    (ii)    Remedies against them civil, criminal and tortious- specific relief Act, writs.

**Leading Cases**
1    Aron Soloman v. Soloman and Co. (1897) AC 22
2    Royal British Bank v. Turkund (1856) 119 ER 886
3    Bell House Ltd v. City Wall Properties Ltd (1966) SC 2 QB 656
4    Bajaj Auto Ltd v. N.K. Farodia & Others, AIR 1971 SC 321
5    Tata Engg and Locomative Co Ltd v. State of Bihar AIR 1965 SC 40
6    Seth Mohan Lal v. Grain Chambers Ltd AIR 1968 SC 772
7    Vasudev Ram Chandra Shelat v.s Pranlal Jaya Nand Thakur
    AIR 1974 SC 1728
8    Shanti Prasad Jain v. Kalinga Tubes Ltd AIR 1965 SC 1535

**Select Bibliography**
1    Atiya: The companies act, 1956
2    Avtar Singh: Company law (English and Hindi)
3    L.C.B. Gower: Principles of Modern Company Law
4    A. Ramaiya: Guide to the Companies Act
5    R.R. Pennigton: Company Law
6    S.M. Shah: Lectures on Company Law
7    N.V. Paranjape- Company Law (amended upto date)

## PAPER - 2.5 PUBLIC INTERNATIONAL LAW

**Max. Marks: 100**                                                              **Min. Pass Marks: 36**

### UNIT-I

Definition, Historical developments, Nature and Basis of International Law, is International Law a true Law?Weaknesses of International Law Codification and development of InternationalLaw, Relation between International Law and State Law,

Sources of InternationalLaw, Subjects of International Law, Place of individual in International Law,Nationality, Extradition and Asylum

## UNIT-II

States in general, Kinds of States and Non-State entities, Acquisition and loss ofState Territory, Territorial water, Continental Self, Contiguous zone and exclusiveeconomic zone, Freedom of the High Sea and PiracyRecognition of States and Governments, Recognition of Insurgency andbelligerency, do facto and de jure recognition, State succession, state Jurisdiction,state Responsibility, Intervention

## UNIT-III

**Diplomatic agents:** Counsels, Classification and Functions of diplomatic agents,Privileges and Immunities of diplomatic agents with reference to ViennaConvention on Diplomatic Relation, 1961. **Treaties:** Definition, Basis,classification and formation of treaties. Interpretation and revision of treaties,principles of jus cogens and pacta sunt survenda, termination of treaties. ViennaConvention on the Law of Treaties. Pacific and compulsive means of settlement ofinternational disputes

**International Institution:** League of Nations, United Nations. History and formationof United Nations, Organs of United Nations with specific reference to GeneralAssembly, Security Council and International Court of Justice, New InternationalEconomic Order and Disarmament. Secretariat, International Criminal Court.

## UNIT-IV

**War:** Its legal character and effects, Enemy character, Armed conflicts and otherhostile relations, belligerent Occupation, War Crimes, termination of war anddoctrine of postliminium, Prize courts, Genocide

The law of Neutrality-Basis of neutrality, Rights and duties of neutral state andbelligerent States. Quasi neutrality and U.N. Charter. Right of Angary, Contraband,Blockade, unneutral Service, Right of Visit and Search.

## UNIT-V

Human Rights: Introduction, Meaning, Definition & Brief History. The Protection of Human Rights Act 1993 National Human Rights Commission, Human RightsCommission of Rajasthan, Role of Judiciary in Promotion and Protection of HumanRights.

Universal Declaration of Human Rights, 1948, Covenant on Civil and PoliticalRights 1966 and covenant on Economic Social and Cultural Rights, 1966

**Leading Cases:-**
1    United Kingdom v.Norway (Anglo Norwegian fisheries case)
      ICJ Report 1951 p. 116
2    The Nuremberg judgment, International Military Tribunal,
      Nuremberg 1946 AJIL Vol. 41, 1947 p. 172
3    In Re Government of India and Mubarak Ali Ahmad 1952 1 II Er 2060

4    Khutch Tribunal award case- foreign affairs report volume XVII    March 68.

5    Right to passage over Indian territory case ICJ Report 1957 p. 125

**Select Bibliography-**

1    Stark J.G.: An introduction to International Law

2    Oppenheim- International Law Vol. I and II

3    Grotious : Modern International Law

4    Breirly- The Law of Nations

5    Nartin Dixon- Textbook on International Law

6    Dr. H.O. Agarwal- International Law and Human Rights

7    S.K. Kapoor- International Law, Human Rights (English and Hindi)

<h1 align="center">PAPER - 2.6 LABOUR LAWS- I</h1>

**Max. Marks: 100**                                      **Min. Pass Marks: 36**

<h2 align="center">UNIT-I</h2>

**Historical perspective of labour:**

**(i) Labour through the ages:** slave Labour- guild system divisionon caste basis labour during feudal days.

**(ii)   Labour Capital Conflicts:** Exploitation & Labour profit motive, poor bargaining power, poor working condition, unorganized labour bonded labour, surplus, labour division of labour.

(iii) Transition from exploitation to protection and from status to contract.

<h2 align="center">UNIT -II</h2>

**Industrial Dispute Act:** Scope and Object definitions, assistance to bipartite settlement, work committee, conciliation officer, authorities for saving disputes, reference power. Provision Relating to Lay-off,

<h2 align="center">UNIT - III</h2>

**Trade Unionism:**

**Trade Union Freedoms:** International perspective

The history of trade union movement in India, Right to trade union as part of humanright, freedom of association- international norms and the Indian constitutionThe Trade Union Act, 1926: definitions, registration of trade union, functions ofregistrar, cancellation of registration and incorporation of registered tradeunions. Funds- political and general, rights and liabilities of registered tradeunion, immunities, office bearers, change of name, amalgamation anddissolution of trade union, penalties.

<h2 align="center">UNIT-IV</h2>

Complete Factories Act, 1948- Definitions, inspectors, provisions regarding health, safety,

Welfare, provision relating to employment of young person, women workers, Annual leave with wages &Penalties.

## UNIT-V

**Protection of the Weaker Sections of Labour:** Tribal labour: need for regulation, unorganized labour like domestic servants- problems and perspectives, bonded labour,

(Regulation & Abolition Act, 1970), Child Labour Prohibition Act, 1986

**Leading Cases:-**

1. Workmen of Indian Standard Institutions v. Indian Standard Institution AIR 1976 SC145.
2. Burmah Shell Co v. Burmah Shell Management Staff Association1970 I FLL J. 590 SC, AIR 1971 SC 922.
3. Workmen of firestone Tyre and Rubber Co. Ltd. v. The Management of FirestoneTyre and Rubber Co. Ltd. AIR 1972 SC 1227.
4. Delhi Cloth and General Mills Co Ltd v. Ludh Budh Singh AIR 1972 SC 1031
5. Jay Engineering Works v. State of West Bengal, AIR 1990 Cal 406
6. Bidi Leaves and Tobacco Merchants Association India and other v. State of Bombay AIR 1962 SC 486
7. Bangalore Water Suppy v. A. Rajappa AIR 1978 SC 548
8. Express Newspapers Ltd v. Union of India AIR 1958 SC 578

**Select Bibliography-**

1. O.P. Malhotra: Law of Industrial Disputes
2. S.C. Srivastava: Social Security and labour laws
3. V.V. Giri: Labour problems in Indian industry
4. R.C. Saxena: Labour problems and social welfare
5. S.N. Mishra: Labour and Industrial Laws
6. Anil Sachdeva: Industrial and Labour Laws
7. K.N. Pillai: Labour and Industrial Laws
8. Ganga Sahai Sharma: Shram Vidhi
9. N.D. Sharma : Shram Vidhi
10. Gopi Krishan Arora : Shram Vidhi

## PAPER - 2.7 LABOUR LAWS- II

**Max. Marks: 100**                                    **Min. Pass Marks: 36**

### UNIT -I

**State regulation of industrial relations-**

 The Industrial Dispute Act, 1947: Strike and Lockout, Lay off and retrenchment, special provision relation of layoff, public utility services.

Retrenchment and Closure transfer of undertakings, penalties, Change in condition of service during pendency of dispute, unfair labour practices

## UNIT -II

Workmen's Compensation Act, 1923: Historical perspective, Constitutionality of the Act; Definitions, Compensation for workmen; commissions: Appointment, function and power; Jurisdiction of civil court, Registration of agreement; Appeals and Power of State Government to make rules.

## UNIT - III

Employee' State Insurance Act, 1948 Preliminary, definitions, corporation, standing committee andMedical benefit council; Employee State Insurance fund and purpose for which expenses can be incurred from the fund. Contribution Inspection function and duties; Recovery of contribution; Benefits Adjudication of disputes and claims; penalties; Miscellaneous provision.

## UNIT -IV

Payment of Gratuity Act, 1972 Definition; payment of gratuity, forfeiture of gratuity, determination of the amount of gratuity, nomination, rights of the nominees; recovery of gratuity, appointment of inspectors and their powers; penalties, cognizance of offence; protection of action taken in good faith; protection of gratuity.

Maternity Benefit Act, 1961 Definition, Maternity benefits; Right, obligations, Inspectors : appointment, power,, duties, penalties and Miscellaneous provision.

## UNIT -V

**Remuneration for labour-** Theories of wages, concept of wages, components of wages, disparity in wages. The Minimum Wages Act, 1948: objects, definitions, fixation of minimum rates of wages, inspectors, payment of minimum rates of wages,overtime claims. Payment of Wages Act, 1936.

**Leading Cases:-**

1. Workmen of Indian Standard Institutions v. Indian Standard Institution AIR 1976 SC145.
2. Burmah Shell Co v. Burmah Shell Management Staff Association
1970 I FLL J. 590 SC, AIR 1971 SC 922.
3. Workmen of firestone Tyre and Rubber Co. Ltd. v. The Management of FirestoneTyre and Rubber Co. Ltd. AIR 1972 SC 1227.
4. Delhi Cloth and General Mills Co Ltd v. Ludh Budh Singh AIR 1972 SC 1031
5. Jay Engineering Works v. State of West Bengal, AIR 1990 Cal 406
6. Bidi Leaves and Tobacco Merchants Association India and otherv. State of Bombay AIR 1962 SC 486.
7. Bangalore Water Suppy v. A. Rajappa AIR 1978 SC 548
8. Express Newspapers Ltd v. Union of India AIR 1958 SC 578

**Select Bibliography-**
1. O.P. Malhotra: Law of Industrial Disputes
2. S.C. Srivastava: Social Security and labour laws
3. V.V. Giri: Labour problems in Indian industry
4. R.C. Saxena: Labour problems and social welfare
5. S.N. Mishra: Labour and Industrial Laws
6. Anil Sachdeva: Industrial and Labour Laws
7. K.N. Pillai: Labour and Industrial Laws
8. Ganga Sahai Sharma: Shram Vidhi
9. N.D. Sharma : Shram Vidhi
10. Gopi Krishan Arora : Shram Vidhi

# PAPER - 2.8 ADMINISTRATIVE LAW

**Max. Marks: 100**                                      **Min. Pass Marks: 36**

## UNIT-I

**Evolution, nature and scope of Administrative Law:** from a laissez faire to a social welfare state, evolution of administration as the fourth branch of government, conseil'detate, definition and scope of Administrative Law, relationship between Constitutional Law and Administrative Law, separation of powers and rule of law

**Civil services in India:** Nature and organization of civil services: from colonial relics to democratic aspiration, powers and functions, accountability and responsiveness: problems and perspective, administrative deviance-corruption, nepotism and mal-administration

## UNIT-II

**Legislative powers of administration:** Necessity for delegation of legislative power, constitutionality of delegated legislation- powers of exclusion, inclusion and power to modify statute, requirement for the validity of delegated legislation. Legislative and judicial control of delegated legislation, sub-delegation of legislative powers. publications of delegated legislation, administrative directions, circulars and policy statements.

## UNIT- III

**Judicial powers of administration:**
  (i)   Need for devolution of adjudicatory authority on administration. Administrative tribunals-need, nature, constitution, jurisdiction and procedure. Distinction between quasi-judicial and administrative functions.
  (ii)  Principles of natural justice- the right to hearing- essential of hearing process, no man shall be judge in his own cause, no man shall be condemned unheard, reasoned decisions, the right to counsel.

**Judicial control of administrative action:** grounds-jurisdictional error, ultravires, abuse and non exercise of jurisdiction, error apparent on the face of record, violation of principles of natural justice, violation of public policy, unreasonableness and legitimate expectation. Remedies in judicial review, writs, declaratory judgments and injunctions, specific performance and civil suits for compensation.

**Administrative discretion:** Need for administrative discretion, administrative discretion and rule of law, limitations on exercise of discretion-malafide exercise of discretion, constitutional imperative and use of discretionary authority.

**UNIT- V**

**Contractual and tortious liability of state:** Tortious liability, sovereign and non sovereign functions, statutory immunity, act of state, contractual liability of government, government privilege in legal proceedings-state secrets, public interest, transparency and right to information.

**Corporation and Public undertakings:-** State monopoly, liability of public and private corporations- departmental undertakings, legislative and governmental control, legal remedies, accountability- committee on public undertakings, estimate committee.

**Public inquiries and commission inquiry, ombudsman:**

Lokpal, Lokayukta, Vigilance Commission, Parliamentary Committees.

**Right to Information Act, 2005**

**Leading cases:**

1    A.K. Kraipak v. Union of India AIR 1970 SC 150
2    In re Delhi Laws Act, AIR 1951 SC 332
3    Raj Narayan v. Chairman, Patna Administration Committee Patna AIR 1954 SC 569
4    Syed Yaqoob v. Radha Krishnan AIR 1964 SC 477
5    Rohtash industries Pvt Ltd v. S.D. Agarwal AIR 1969 SC 707
6    State of Karnataka v. Union of India AIR 1978 SC 68

**Select Bibliography:**

1    M.C.J kagzi- The Indian Administrative Law
2    I.P. Massey: Administrative Law
3    D.D. Basu: Administrative Law
4    M.A. Fazal: Judicial control of Administrative action in India, Pakistan and Bangladesh
5    Wade: Administrative Law
6    S.P. Sathe: Administrative Law
7    U.P.D. Kesari: Prashasnic Vidhi
8    Jain and Jain- Principles of Administrative Law
9    J.J.R. Upadhayay- Prashasnic Vidhi

**Max. Marks: 100**                                    **Min. Pass Marks: 36**

## UNIT-I

**Basic concept:** Assessment year, Previous year, Person, Assessee, Income,Agricultural Income, Casual Income, Capital Asset, Charitable purpose, Total Income,Gross Total Income, step system and slab system, Capital and Revenue, Avoidance oftax and tax evasion, Income tax authorities. Residential; status and Tax Incidence – Exemptions and deductions of Income

**General Perspective:** History of tax law in India, fundamentalprinciples relating to tax laws, concept of tax, nature and characteristics of taxes, distinction between tax and fees, tax and Access, direct and indirect taxes, tax evasion and tax avoidance, scope of taxing powers of parliament, state legislature and local bodies.

## UNIT-II

Income Tax Act, 1961, Income under the Head `Salaries' Income from House Property, Income of other persons included in Assessee's Total income.

## UNIT-III

Profits and Gains of Business or Profession, Depreciation allowance, Capital Gains, Income from other sources, Set off and carry forward of losses

## UNIT-IV

Return of Income, Assessment and Re-assessment, Assessment of Firms and Partners and Penalties offences and prosecution under this Act, Appeal and revision

## UNIT-V

**Wealth Tax Act:**

Valuation date, Net Wealth, Incidence of Tax, Assets, Assets exempted from Tax
Return of Wealth, Assessment, Time limit for completion of assessment

**Key Features of The Central Goods And Services Tax Act, 2017**

**Leading Cases:**

1    P. Krishana Menon v. CIT, AIR 1956 SC 75
2    CIT West Bengal v. Benoy Kumar Saha Roya, AIR 1957 SC 761
3    Mala Ram & Sons v. CIT AIR 1956 SC 367
4    Pingle Industries Ltd v. CIT AIR 1960 SC 1934
5    Banaras Cloth Dealers Syndicate v. Benaras 1964 ITR 50
6    CIT v.Kothari (1963) 40 IITR 107 (SC)

**Select Bibliography**

1    Ramesh Sharma, Supreme Court on Direct taxes
2    Kanga and Palkiwala, The Law and practice of Income Tax
3    R.V. Patel, The Central Sales Tax Act
4    S.D. Singh, Principles of Law of Sales Tax
5    H.C. Malhotra, Aykar Vidhan Lekha

6      Bhagwati Prasad, Aykar Vidhi
7      S. Bhattacharya : Indian Income Tax Law and Practice.
8      A.K. Saxena : Law on Income tax in India.
9      Nathulal Jain : Ayakar Vidhi.
10     Kailash Rai: Ayakar Vidhi.

## PAPER - 2.9 (B) INSURANCE LAW

**Max. Marks: 100**                                            **Min. Pass Marks: 36**
### UNIT- I
**Introduction- definition**, nature and history of insurance, concept of insurance and law of contract and law of torts, future of insurance in globalize economy, history and development of insurance in India, insurance regulatory authority- role and functions.

**General principles of law of insurance-** Contract of insurance- classifications of contract of insurance, nature of various insurance contracts and parties thereto principle of good faith, insurable interest, the risk, the policy-classification of policies- its forms and contents, its commencements, duration, cancellation, alteration, rectification, renewal, conditions of the policy.

### UNIT- II
**Life Insurance:** Nature and scope of life insurance, definition, kinds of life insurance, the policy and formation of a life insurance contract, event insured against life insurance contract, circumstances affecting the risk, amount recoverable under life policy, persons entitled to payment and settlement of claims.

### UNIT- III
**Marine Insurance:** (The Marine Insurance Act, 1963) Nature, scope, classification of marine policies, insurable interest, insurable value, conditions of policy. Voyage-deviations, perils of the sea, partial loss of ship and of freight, salvage, general average, particular charges, measure of indemnity, total valuation, liability to third parties.

**Fire insurance:** nature of fire insurance contract, non-disclosure and misrepresentation, standard fire policy, proximate cause, claims.

### UNIT- IV
**Insurance against third party risks:** The Motor Vehicle Act 1988-chapter VIII- definitions, abuse, drives and motor vehicles, requirements of policy, statutory contract between insurer and drive rights of third parties, limitation of third party's rights, duty to inform third party, claims tribunal- constitution, functions, applications for compensation-who can apply? Procedure and powers of claims tribunal-its award

### UNIT- V
**Social insurance in India:** important elements in social insurance, its needs, commercial insurance and social insurance. Sickness insurance, Adarkar Scheme, Stack and Rao

scheme for wage earners and others risks covered, maturity and other benefits. Old age, premature death and invalidity insurance or pension insurance, public provident fund, unemployment insurance, social insurance for agricultural and un-organized labourers.

**Public liability insurance:** the scheme and authorities

**Leading cases:**

1    Glickman v. Lancashire and General Assurance Co. (1925) 2 KB 593
2    Johnson v. Marshall (1906) AC 409
3    Digby v. General Accident Fire and Life Insurance Co. Ltd. (1943) AC 121
4    Minu B. Mehta v.Balakrishna AIR 1977 SC 1248
5    Prudential Insurance Co. v.Inland Revenue Commissioner (1904) 2 KB 658.

**Select Bibliography**

1    Singh, B Anand, New Insurance Law
2    Sreenivasan, M.N.- Principles of Insurance Law
3    Banerjee, Law of Insurance
4    Mitra, B.C., Law relating to Marine Insurance
5    Srivastava, Blachand: Elements of Insurance
6    Dravid and Joshi: Bima Siddhant evam Vyavahar.

## PAPER - 2.9 (C) BANKING LAW INCLUDING NEGOTIABLE INSTRUMENT ACT, 1881

**Max. Marks: 100**                                             **Min. Pass Marks: 36**

### UNIT- I

**Introduction:**Banking: definition-common law and statutory lawCommercial Banks: functionsAgency servicesGeneral utility servicesInternational trading serviceInformation servicesSystems of banking: unit banking, branch banking, group banking and chain banking,banking companies in India.

### UNIT- II

**Banks and Customers:**

- Customer meaning
- Banker and customer relationship
- Rights and obligations of banks- Right of set off, banker's lien, right to charge interest and commission, obligation to honour customer's cheques.
- Duty- Duty of confidentiality, nature and justification of the duty, exceptions
- Accounts of Customers- Current accounts, deposit accounts, joint accounts, trust accounts.

### UNIT- III

**Control over Banks:** Control by Government and its agenciesNeed for elimination of systematic risk, avoidance money Laundering, consumer protection, promotion of fair

competition, Account, audit, money lending, re-organization and reconstruction, supervision and winding up.Control by ombudsmanReserve Bank of India (RBI) Act, 1934: definition, functions and powers, supervision and control over the other banks, control over non-banking financial institutions, capital management and business, determination of bank rate policy.

## UNIT- IV

### Lending by Banks

Principles of good lending, Securities for bank advances- pledge, mortgage, charge, goods or documents of title to goods, life insurance policies as securities, debentures as security, guarantee as security. Contract of guarantee and contract of indemnity, Repayment, interest: rule against penalties.Default and recovery- debt recovery tribunals- constitution and functioning.

### Letter of Credit and Demand guarantee

Letter of credit,Basic featuresParties to a letter of creditFundamental principles

Demand guarantee- legal character, distinction between irrevocable letter of credit and demand guarantees

## UNIT- V

### Law relating to negotiable instruments: (Negotiable Instruments Act, 1881)

Negotiable instruments- kinds,Holder and holder in due course, Parties, negotiation, presentiment , Discharge from liability,**Dishonour-** civil and criminal liabilityDuty to honour customer's cheques- conditions, exceptions to the duty to honour chequesMoney paid by mistakeThe collecting banker- liability for conversion, duties, good faith and statutory protection to the collecting banker.

### Leading Cases:

1    A.B. Miller v. National Bank of India ILR 19 Cal 146
2    National Insurance Co. Ltd v.Seema Malhotra (2001) ILRI 543
3    Radha Kisan v.Hira Lal AIR (1919) Nag 39
4    Maneckji Pestonji Bharucha v.Wadilal Sarabhai AIR 1926 PC 38
5    Nawab Major Sir Mohammad Akbar Khan v.Attar Singh AIR 1936 PC 171

### Select Bibliography-

1    S.N. Gupta, The Banking Law in theory and practices.
2    S.N. Gupta, Banks and the consumer protection law.
3    Mukherjee, T.K.- Banking Law and Practice.
4    Shekhar K.C- Banking theory and practice.
5    Kailash Rai- Negotiable Instrument Act.
6    Sharma and Sharma- Banking Vidhi.
7    Mangilal Sharma: Banking Vidhi Evam Vyavhar

# PAPER - 2.10 PUBLIC INTEREST LAWYERING;
# LEGAL AID AND PARA LEGAL SERVICES
**The paper shall consist of following two parts:**
**A. WRITTEN PAPER**

**Max. Marks: 80**                                                **Min. Pass Marks: 29**
## B. PRACTICAL PAPER

**Max. Marks: 20 Marks**                                      **Min. Pass Marks: 07**

The practical exam shall be conducted by a committee of 2 examiners. In this committee there shall be one internal examiner and one external examiner.

**A.     Written Paper**

## UNIT-I

**IntroductionPIL:** its origin and meaningScope and nature of PILObject of PIL,PIL and Private Interest Litigation

**Locus Standi:**Principle of locus standi- traditional approachLiberal approachGuidelines for entertaining a PILPetition by public spirited person or associationMisuse of PIL

**PIL and enforcement of Fundamental Rights:**GeneralCompensation for breach of fundamental rightsCompensation for illegal detentionCompensation to victim of police atrocities.PIL as a redress to custodial violence cases. PIL and Environmental Law

## UNIT- II

**Pollution- a curse to mankind**

Pollution free environment as a fundamental right

Enforcement of environmental laws through filing PIL

**PIL for the enforcement of the rights of weaker sections of the society**

For the enforcement of the rights of women

For the enforcement of the rights of children

For the enforcement of the rights of bonded labour

## UNIT- III

**Legal Aid:**Meaning, Nature, Scope, and DevelopmentConstitutional provisions; Provision of civil procedure code and code of criminal procedure regarding legal aidThe Legal Services Authorities Act and legal aid.

**Drafting of PIL petitions and writing of applications for legal aid**

## UNIT-IV

**The Legal Services Authorities Act, 1987 (as amended by the Act of 2002)**

**The national legal services authority:** constitution and functions

**State legal services authority:** constitution and functions

**District legal services authority:** Taluk legal services committee, constitution and functions

**Lok Adalat:** organization, cognizances of cases, award and powers.

Pre litigation, conciliation and settlement

**Permanent lok adalat:** establishment, cognizance of cases, procedure and award

**The Rajasthan State Legal Services Authority Regulations,1999:** Legal literacy, legal awareness committee: Constitution and functions of High Court and District Legal awareness committeeOrganization of legal awareness camps by law schoolsRole of voluntary organizations

**Leading Cases:**

1. Bandhua Mukti Morcha v. Union of India AIR 1984 SC 802, (1984) 3 SCC 161
2. Olga Tellis v. Bombay Municipal Corporation (1985) 3 SCC 545, AIR 1986 SC 180
3. Sukdas v. Union Territory of Arunachal Pradesh (1986) 2 SCC 401, AIR 1986 SC 991
4. Sheela Barse v. State of Maharashtra AIR 1983 SC 378

**Select Bibliography**

1. Dr. S.R. Myneni- Public Interest lawyering legal aid and para legal services
2. Sujan Singh- Legal aid-human right to equality
3. S.S. Sharma- legal assistance to Poor
4. P.N. Bhagwati- legal aid as human right
5. P.N. Bajpayee- Legal aid and the Bar council
6. Sunil Deshtra- lok adalats in India- genesis and functioning
7. Sampat Jain- Public Interst Litigation
8. Dr. Kailash Rai- Janhit Vakalat, vidhik sahyog evam ardh vidhik sevayen.
9. Suresh Bhatia- Nirdhan Vidhik Shayta, Rajasthan Hindi Granth  Academy
10. P.M. Bakshi- Public Interest Litigation

## B. PRACTICAL PAPER

The candidate shall be required to attend at least two legal aid camps organized by the college. The candidate shall also be required to present a report regarding the problem along with his suggestions.

(1)    Attendance at the legal aid camp and
Submission of report-                    10 Marks
(2)    Viva voce-                              10 Marks
The Viva-voce examination shall be conducted by a committee of 2 persons. In this committee there shall be one internal examiner and one external examiner.

# LL.B. THIRD YEAR EXAMINATION
## COURSE CONTENTS

**Note:** **Theories Paper (Compulsory and Optional Both)**

The syllabus has been divided into five units. Questions will be set from each unit.

The questions paper shall contain three sections. Section A shall contain 10 questions two from each unit of 2 marks each. The Candidate is required to answer all the questions. The answers should not exceed 50 words. Section B shall contain 5 questions one from each unit with internal choice each question shall be of 8 marks. The answers should not exceed 200 words. The candidate is required to answer all the questions. Section C shall contain 5 questions of 20 marks each, one from each unit. The candidate is required to answer any 2 questions. The answers shall not exceed 500 words.

In order to ensure that students do not leave out important portions of the syllabus, examiners shall be free to repeat the question set in the previous examination.

In the case of discrepancies between English and Hindi Version, English Version will prevail.

Acts are to be read with their Amendments

**Practical Paper:**

The syllabus has been divided into four units. Questions will be set from each unit.

The questions paper shall contain three sections. Section A shall contain 8 questions two from each unit of 2.5 marks each. The Candidate is required to answer all the questions. The answers should not exceed 50 words. Section B shall contain 4 questions one from each unit with internal choice each question shall be of 10 marks. The answers should not exceed 200 words. The candidate is required to answer all the questions. Section C shall contain 4 questions of 20 marks each, one from each unit. The candidate is required to answer any 1 question. The answers shall not exceed 500 words.

In order to ensure that students do not leave out important portions of the syllabus, examiners shall be free to repeat the question set in the previous examination.

In the case of discrepancies between English and Hindi Version, English Version will prevail.

Acts are to be read with their Amendments.


## 3.1 LAW OF EVIDENCE

**Max. Marks: 100**                                   **Min. Pass Marks : 36**
### UNIT- I

**Preliminary:** Application of IndianEvidence Act. Definitions: Court, fact-fact in issue and relevant fact, evidence - meaning and its kinds, proved, disproved, not proved, may presume, shallpresume and conclusive proof, Presumptions of fact and law, presumptionsregarding documents. Relevancy of facts: Explaining Res-gestae,

occasion, cause, effect; motive, intention, preparation, previous and subsequent conduct, introductory andexplanatory facts,facts not relevant when become relevant, accidental and incidental facts,Facts which need not be proved, improper admission and rejection of facts.

## UNIT-II

**Admission and Confession:**

    (a)    Admission: Definition, whose admission is relevant, relevancy of admission in civil cases, admission is not conclusive proof. Admission and Estoppel.

    (b)    Confession: definition, its kinds, confession caused by inducement, threat or promise, confession to police officer, confession in the custody of police,confession to Magistrate, confession by co-accused.

    (c)    Difference between admission and confession, Relevancy of statements.

    (d)    Dying Declarations- The justification for relevance on dying declarations (Section 32), The judicial standards for appreciation of evidentiary value of dying declarations.

Other Statement by Persons who cannot be called as Witnesses - General Principles, Special problems concerning violation of women's rights in marriage in the law of evidence.

## UNIT- III

**Statement made under special circumstances**

**Relevancy of judgement of a court of law**

**Opinion ofthird person**

**Opinion of experts / third person**

**Relevancy of character**

**Evidence:** Oral evidence, documentary evidence, kinds ofdocumentary evidence, when secondary evidence is relevant. Public and private document. Exclusion of oral evidence by documentary evidence: Application of this principle and its exceptions, ambiguous documents, kinds of ambiguity.

## UNIT- IV

**Burden of Proof:** Meaning, general principles of burden of proof in civil and criminal cases and exceptions to it. When burden of proof shifts, proof of legitimacy of child, proof in dowry deaths and in the matters of rape.

**Estoppels:** meaning, essentials, nature and its kinds. Competency of witnesses, when a person can be compelled to appear as witness, privileged communications and documents, accomplice, hostile witness.

## UNIT- V

**Examination of Witnesses:** Order of examinations. kinds of examinations. leading question, impeaching the credit of witness, questions which can and which cannot be asked, refreshing the memory of witness, production of documents, Judge's power to put questions and to order production. Effect of improper acceptance or rejection of evidence.

**Leading Cases:**

1.Nishi Kant Jha v. State of Bihar, AIR 1969 SC 422.

2.Himachal Pradesh Administration v. Om Prakash AIR 1972 SC 975.

3.Sat Paul v. Delhi Administration, AIR 1976 SC 294.

4.Laxmipat Chorasia v. State of Maharashtra, AIR 1968 SC 938.

5.Pakala Narayan Swami v. Emperor, AIR 1939 PC 47.

6.Bhardwade Bhogin Bhan HerrjiBhai v. State of Gujarat AIR 1988 SC 753.

7.RM Malkani v. State of Maharashtra, AIR 1973 2SCR 417

**Select Bibliography:**

1. Ratan Lal - The law of Evidence

2.Batuklal- Law of Evidence

3.Vepa P. Sarathi - Law of Evidence

4.Raja Ram Yadav- Law of Evidence (Hindi)

5.Shyam Sunder Sharma- Law of Evidence (Hindi)

## PAPER - 3.2, THE CODE OFCRIMINAL PROCEDURE, 1973, JUVENILE JUSTICE ACT, 2015 AND PROBATIONOF OFFENDERS ACT, 1958.

**Max. Marks: 100**                                     **Min. Pass Marks: 36**

### UNIT- I

**The Code of Criminal Procedure, 1973**

**1. Preliminary:**

    (a) Object, Extent and definitions (Chapter 1)(b) Duties of Public:(i) To assist to police and Magistrate(ii)To give information about certain offences (ChapterIV Ss. 37 to 40)

**Criminal Courts**(a) Territorial divisions andClassifications (Chapter II, Ss 6 to 25).

           (b) Powers (Chapter III, Ss. 26 to 31).

### UNIT- II

**Pre-Trial Procedure:**

    (a) Arrest of Persons (Chapter V)

    (b) Process to compel appearance (Chapter VI).

    (c) Process to compel Production of things (Chapter VII).

    (d) Information to the Police and their powers of Investigation (Chapter XII)

    (e) Bail (Chapter XXXIII).

(f)　Jurisdiction of the courts in inquiries and trials (Chapter XIII); Order to furnish security for keeping peace and good behaviour (ss. 106-124)

(g)　Maintenance of Public Order and Tranquillity (Chapter-X)

Conditions requisite for initiation of proceedings, Complaints to Magistrates, Cognizance of Offence and Charge (Chapter XIV, XV and XVII).

## UNIT-III

**Types of Trials**

(i)　Trial before Court of Session (Chapter XVIII).

(ii)　Trial of Warrant and Summons Cases (Chapter XIX & XX)

(iii)　Summary Trials (Chapter XXI)

(iv)　Maintenance of Wife, Children and Parents (Sec. 125 to 128).

## UNIT - IV

**Judgment (Chapter XXVII)**

(a)　Appeal (Chapter XXIX) Reference and revision (Chapter XXX).

(b)　Misc. Provisions:

(i) Irregular proceedings (Chapter XXXV)

(ii)Period of Limitation (Chapter XXXVI)

(iii)Autrefois acquit and Autrefois convict (Sec 300).

(iv)Legal Aid to the accused at State Expenses (S. 303 & 304)

(v) Pardon to an accomplice (Sec 306 to 308)

(vi)Saving of Inherent powers of High Court (Sec. 482).

## UNIT- V

**The Juvenile Justice Act, 2015.**

Definitions, Competent authorities and institutions for juveniles, Neglected Delinquent Juveniles. Procedures and competent authorities, special offences in respect of juveniles.

**Probation of offenders Act, 1958:**

Definitions, Power of court to require released offenders after admonition on probation of good conduct, power of Court to require released offenders to pay compensation under twenty one years of age, Variations of conditions of probation, Probation in case of 'Offender' failing to observe conditions of bond, provision as to sureties, Probation Officers, Duties of Probation Officers.

**Leading Cases:**

1. Tehsildar Singh v. State of UP , AIR 1959SC. 1012

2. State of U.P. v. Singhara Singh, AIR 1964 SC 359.

3. Nisar Ali v. State of U.P. AIR 1957 SC 336.

4. Purshottam Das Dalmia v. State of West Bengal, AIR 1961 SC. 1589.

5. State of Andhra Pradesh v. Cheemalapati Ganeshwara Rao, AIR 1963 SC 1850

6. Satwant Singh v. State of Punjab, AIR 1960 S.C. 266.

**Select Bibliography :**
1.Ratan Lal : Criminal Procedure Code.
2.Bhadu Vinod :Criminal Procedure Code (Hindi/English)
3.Kelkar R.V. : Criminal Procedure Code
4.Probation of Offenders Act, 1958.
5.Chakravarti,N.K. - Probation system - in the Administration of Criminal justice.
6.Tiwari Y.K.- CR.P.C (Hindi)
7.Thakker C.K. : Criminal Procedure Code.
8.M.D. Chaturvedi- CR.P.C etc. (Hindi)
9.B.L. Babel- CR.P.C (Hindi)

## PAPER 3.3. THE CODE OF CIVIL PROCEDURE 1908
## AND THE LIMITATION ACT, 1963

**Max. Marks: 100**                                                  **Min. Pass Marks 36**
### UNIT-I
Definitions, suits in general, suits of civil nature, stay of suit,Res judicata, Res subjudice, ForeignJudgment

### UNIT-II
Place of trial, Transfer of suits, Joinder, non-joinder and mis-joinder of parties and causes of action, Service of Summon, Attachment before judgment, Arrest before Judgment. Supplemental proceedings.

### UNIT- III
**Execution in general:** Courts by which decrees may be executed, powers of the courtexecuting the decrees. Transfer of decrees for execution and modes of execution, Stayof execution, Suits in particular cases (Orders xxix to xxxiii). Abatement of suits, summaryproceedings.

### UNIT- IV
Temporary injunction and Appointment of Receiver, Appeals-Appeals against orderand appeal against decree, Review. Revision and Reference, Transfer of cases, Restitutions, Caveat, Inherent powers

### UNIT- V
**The Limitation Act, 1963 (Omitting the Schedule) Definitions:**Purpose, Policy, Scope, Applicant, bond, Defendant, easement, good faith, plaintiff, period of limitation Relationship between limitation, laches, acquiescence, estoppels and res judicata;Limitation of suits, appeals and applications, disability, computation of period of limitation, acknowledgement and part payment, acquisition of ownership byprescription
**Leading Cases:**
1. Shri Sinha Ramanuja v. Ranga Ramanuja, AIR 1961 SC 1720.
2.Seth Hukamchand v. Maharaja Bahadur Singh AIR 1933 PC 193

3.Narain Bhagwant Rao v. Gopal Vinayak AIR 1960 SC 100
4.Garikapati Veerava v. Subbiah Chaudhary, AIR 1957 SC 540.
5.Deoki Nandan v. Murlidhar, AIR 1957 SC 133.
6.Deity Pattabhirama Swamy v. Hanmayya, AIR 1959 SC 57.
7.S.M. jakati v. B.M. Borker, AIR 1959 S.C. 282.

**Select Bibliography:**

1.Mulla- Civil Procedure Code.
2.Singh S.N. - Civil Procedure Code.
3.Sahai on Civil Procedure.
4.Tandon, M.P. - Civil Procedure Code (English & Hindi)
5.Mridula Srivastava - Civil procedure Code (Hindi)
6.A.N. Pandey - Civil Procedure Code (Hindi)
7.C.K. Tekwani- Civil Procedure Code
8.T.P. Tripathi- Civil Procedure Code (Hindi)

## PAPER - 3.4 LEGAL LANGUAGE, LEGAL WRITING INCLUDING GENERAL ENGLISH AND INTERPRETATION OF STATUTES.

**Max. Marks : 100**                                          **Min. Pass Marks:36**

### UNIT-I

Meaning of interpretation, its distinction from constructions, kinds of interpretationGrammaticaland logical, intention of legislationCardinal principles of interpretation; Plain meaning rule; Golden rule and mischief rule,Aids to interpretation, Internal : Long title, Preamble, Headings, marginal Notes, Nonobstante clause, Punctuation, Proviso, External : Parliamentary History; legislativedebate, Reports of Committees and Commission, Statement of Objects and Reasons,Historical facts and surrounding circumstance, Dictionary.

### UNIT-II

Maxims of interpretation: Ejusdem Generies, Nosciture a Sociis, Utres magis valeatqavam pereat, Statute in pari materia, Operation of statutes, Expiry and repeal ofStatutes, Mandatory provisions, Use of Statutes, Construction of Fiscal StatutesInterpretation of Penal Statutes and Interpretation of Constitution, colourablelegislation, Doctrine of pith and substance and Doctrine of eclipse, etc.

### UNIT-III

Vocabulary: Use of legal phrases and terms; pairs of words; one word substitution

**(A) Vocabulary:**

**List of Legal terms which are relevant for LL.B. students:**

| | | |
|---|---|---|
| Abet | Abstain | Accomplice |
| Act of God | Actionable | Accused |
| Adjournment | Adjudication | Admission |

| | | |
|---|---|---|
| Affidavit | Amendment | Appeal |
| Acquittal | Articles | Assent |
| Attested | Attornment | Averment |
| Bail | Bailment | Citation |
| Clause | Coercion | Code |
| Cognizable | Confession | Compromise |
| Consent | Conspiracy | Contempt |
| Contingent | Contraband | Conviction |
| Convention | Corporate | Custody |
| Damages | Decree | Defamation |
| Defence | Excheat | Estoppel |
| Eviction | Executive | Ex-parte |
| Finding | Floating charge | Forma Pauperis |
| Franchise | Fraud | Frustration |
| Goodfaith | Guardian | Habeas Corpus. |
| Hearsay | Homicide | Hypothication |
| Illegal | Indemnity | Inheritance |
| Bench | Bill | Bill of attainder |
| Bill of rights | Blockade | Bonafide |
| By-laws | Capital Punishment | Charge |
| Chattles | Justiciable | Legislation |
| Legitimacy | Liability | Liberty |
| Licence | Lien | Liquidation |
| Maintenance | Malafide | Malfeasance |
| Minor | Misfeasance | Mortgage |
| Murder | Negligence | Negotiable |
| Instruments | Neutrality | Non-feasance |
| Notification | Novation | Nuisance |
| Oath | Obscene | Offender |
| Order | Ordinance | Over-rule |
| De-facto | De Jure | Deposit |
| Detention | Discretion | Distress |
| Earnest Money | Enact | Enforceable |
| Equality | Partition | Perjury |
| Petition | Plaintiff | Pledge |
| Preamble | Pre-emption | Prescription |
| Presumption | Privilege | Privity |
| Prize | Process | Promissory Note |
| Proof | Proposal | Prosecution |

| Proviso | Ratify | Receiver |
| Redemption | Reference | Regulation |
| Remand | Remedy | Rent |
| Repeal | Res Judicata | Respondent |
| In Limine | Insanity | Institute |
| Insurance | Interstate | Issue |
| Judgement | Judicial | Jurisdiction |
| Justice | Restitution | Rule |
| Ruling | Schedule | Section |
| Settlement | Sovereignty | Specific Performance |
| Stamp duty | Status quo | Statute |
| Stay of execution | Succession | Summons |
| Surety | Tenant | Testator |
| Testatrix | Title | Tort |
| Trade Mark | Treason | Treaty |
| Trespass | Trial | Tribunal |
| Ultra Vires | Undue influence | Usage |
| Valid | Verdict | Vested |
| Violate | Vis-major | Void |
| Voidable | Wager | Waiver |
| Warrant | Warranty | Will |
| Writ | Wrong | |

## UNIT-IV

Latin maxims: Meaning and use in sentences; Comprehension of legal texts; précis writing

## LIST OF LATIN MAXIMS:

1. Ab initio (from the beginning)
2. Actio personalis moritur cum persona (Personal actions die with the death of person).
3. Actus Curae neminem gravabit (an act of the court shall prejudice no one).
4. Actus non facit reum, nisi mens sit rea (the act itselfDoesnotconstitute guilt unless done with a guilty intent).
5. Actus reus (wrongful act).
6. Ad interim (in the meantime)
7. Ad litem (for the suit).
8. Ad valorum (according to the value).
9. Alibi (Plea of being elsewhere)
10. Amicus curaie (friend of the court)
11. Animus (Intention)
12. Audi alterem partem (hear the other side).
13. Caveat emptor (buyer beware).

14.Consensus ad idem (agreement by two persons upon the same thing in the same sense).

15.Damnum sine injuria (damage without injury).

16.De facto (in fact).

17.De jure (in law).

18.De minimis non curat lex (the law takes no account of trifling matters).

19.Decree nisi (a decree which takes effect after a specified period).

20.Delegatus non potest delegare (a delegated power can not be further delegated).

21.Doli incapax (incapable in malice).

22. Donatio mortis causa (gift by a person on the death bed).

23. Ejusdem generis (of the same category).

24. Eminent domain (the supreme right).

25. Ex-officio (by virtue of an office).

26.Ex-parte (not in the presence of the opposite party).

27. Ex-post-facto (by subsequent act).

28.Factum valet (the fact which cannot be altered).

29.Fait accompli (an accomplished fact).

30.Ignorentia legis neminem excuset (ignorance of law is no excuse).

31.In pari materia (in an analogous case, cause or position).

32.Injuria sine damno (injury without damage)

33.Interest republicae ut sit finis litium (it is in the interest of the republic that there should be an end of law suit).

34. Intra-vires (within the powers)

35.Jus tertii (The right of a third party)

36.Lis pendens (pending suit)

37.Mens rea (a guilty mind)

38.Mesne profits (the profits received bya person on wrongfulpossession).

39.Nemo det quod non habet (no man can't transfer better title than he has himself).

40.Nemo det bis vexari pro et idem causa (no man be twice vexed for the same cause).

41.Nemo in propria causa judex esse debet (no one ought to be a judge in his own case)

42.Nolle prosequi (to be unwilling to prosecute).

43. Obiter dicta (an opinion of law not necessary to the decision)

44.Onus probandi (the burden of proof)

45.Pacta sunt servanda (pact must be respected)

46.Pendente lite (during litigation)     47. Per Capita (per head)

48.Per incuriam (through inadvertence or carelessness).

49.Per stripes (by stocks)

50. Plenum dominium (full stocks)

51.Pro bono publico (for the public good)

52.Ratio decidendi (grounds for decision, principles of the case).

53. Res geste (connected facts forming the part of the same transaction).

54. Res ipsa loquitur (the thing speaks for itself)

55. Res judicata (a matter already adjudicated upon).

56. Res nullius (an ownerless thing)

57. Rule nisi (a rule or order upon condition that is to become absolute when cause is shown to the contrary).

58. Status quo (existing position)

59. Sub judice (in course of adjudication).

60. Sui juris (one's own right).

61. Suo motu (of ones own accord)

62. Ubi jus ibi remedium (where there is a right, there is a remedy).

63. Ultra vires (beyond the powers of).

64. Volenti non fit unjuria (Risk taken voluntarily is not actionable).

## UNIT-V

Writing of legal drafts lettersand applications; Essay writing on topics of legal interest; Translation from Hindi to English and English to Hindi.

Note : Except in a question relating to translation from English to Hindi; answers to Questionsasked in unit 3, 4 & 5th are to be given in English.

**Select Bibliography:**

1. Galnville William : Learning the Law.
2. Wren & Martin : English Grammar.
3. Ganga Sahai Sharma : Fundamental of Legal Writing.
4. Hindi-English Legal glossary : Vidhi Sahitya Prakashan, Ministry of Law, Government of India, New Delhi.
5. David Green : Contemporary English Grammar, structure and composition.
6. Ishtiaque Abidi : Law and Language.
7. Law Lexicon & Legal Maxims by Venketaramanaija.

**Leading Cases :**

1. Heydon's Case (1584) 3 Co Rep. 7a p. 76: ER 637
2. Bengal Immunity Company v.State of Bihar, AIR 1955 SC 661.
3. Alamgir v.State of Bihar, AIR 1959 SC 436.
4. Inder Singh v. State of Rajasthan, AIR 1957 SC 510.

**Select Bibliography:**

1. Maxwell - The interpretation of Statutes.
2. Crawford - Statutory constitution.
3. Craies - Statute Law.
4. Swarup - Interpretation of Statutes.
5. Bindra - Interpretation of Statutes.
6. Sarathi - Interpretation of Statutes.

7.Bhattacharya, T., - Interpretation of Statutes (English & Hindi)
8.Radha Gupta- Interpretation of Statutes (Hindi)
9.Anirooudh Prasad : Interpretation of Statues (Hindi)
10. Jain R.L. : Legal Writing and Legal Language.

## PAPER - 3.5 TRUST, EQUITY AND
## FIDUCIARY RELATIONS

**Max. Marks: 100**                                      **Min. Pass Marks: 36**

### UNIT- I

**Equity:** Concept of Equity –Place function Nature of Equity, Origin and Growth of Equity in England-

### UNIT- II

**Maxims of equity:** Equitable rights - Equitableremedies.

### UNIT-III

**Indian Trust Act, 1882:** Definition- Creation of Trusts- Duties and liabilities of Trustees- Rights and Powers of trustees- Disabilities of trustees- Rights and Liabilities of the Beneficiary, Vacating the office of Trustees- Extinction of Trust- Certain obligations in the nature of Trust.

### UNIT- IV

**Rajasthan Public Trust Act, 1959:** Definition and Validity ofcertainpublic trust- Registration of Public Trust- Management of Public Trust property- Powers of officers in relations to Public Trust-

### UNIT- V

**Control of Public Trust-** Special provisions in respect of certain trust- Dharmada, Procedure and Penalties.

**Fiduciary Relation:**Fiduciary Relationship, Definition, Kinds, classification, Fiduciary principle.

**Leading Cases:**
1.    Hindu religious Endowments, Madras v. Shri Lakshmindar Thiratha Swamiar of Shri Shirur Mutt,AIR 1954 SC 282.
2.    Durgah Committee, Ajmer v. Syed Hussain Ali AIR 1961 SC 1402.
3.    Surajmal Singhvi v.State of Rajasthan , 1966 RLW 556.
4.    Tilakayat Shri Govindlalji v. State of Rajasthan, AIR 1963 SC 1630.

**Select Bibliography:**
1.    Upadhyaya, J.J. R.- Equity, Trusts with Fiduciary Relation and Specific Relief.
2.    Gandhi, B.M- Equity, Trusts and Specific Relief.

3. Varadachari, V.K.- Law of Hindu Religious and Charitable Endowments.
4. Varadachari, V.K. - Public Trusts and Taxation.
5. सिंह, जी.पी. : साम्या, न्यास एवं विशिष्ट अनुतोष अधिनियम

## PAPER 3.6 OPTIONAL PAPER (ANY ONE)
## PAPER - 3.6 (A) CRIMINOLOGY AND PENOLOGY

Max. Marks : 100                                             Min. Pass Marks : 36
### UNIT-I

**Criminology:** Definition, nature and scope, method of studying, importance and classification of crime.

**Criminal behaviour:**(a) Explanations.     (b) Psychological theories, Alcoholism and Drugs.(c)Crime and social process: Economic Motivation, Socio-cultural Motivations, home and community influences, white collar crime, Female offender, juvenile Delinquency, influence of mass-media

### UNIT- II

**Schools of Criminological Thought** (Factors in causation of criminal behaviour)

   i.   Ancient School
        (a) Demonological
        (b)School of Free Will
   ii.  Classical School.
   iii. Cartographic or ecological school.
   iv.  Socialistic School
   v.   Typological School
        (a) Italian or positive school
        (b) Mental Testers School
        (c) Psychiativists School
   vi.    Sociological School.
   vii.   Multi factor School.

### UNIT- III

**Control of Crime:** Police and Law courts, Prison system, Re-socialization of the offender, Rehabilitation of discharged prisoners in the administration of Criminal justice, prevention of crime delinquency.

### UNIT-IV

**Punishment,** Relationship between Criminology and Penology; Theories of Punishment: Expiatory, Preventive and reformative and purposes of punishment.

Penal Science in India: History of Punishment, Pre-classical School, Neoclassical, Positive School. Reformers, Clinical School andmultiple causation approach.

## UNIT- V

**Miscellaneous:** modes of treatment of offenders, corporeal punishment, Transportation of criminals, Capital punishment, imprisonment, reactional treatment, parole, compensation, admonition, sex and adolescent offenders, indeterminate Sentences, Borstal School, Criminal procedural Jurisprudence. Constitutional Guarantees - Principles of natural Justice as applicable in procedural law, Protection to arrested persons. Under-trials, detenue and convicted persons. Double jeopardy, self-in-crimination and right to life and legal aid.

**Leading Cases:**
1.	Gura Singh v.State of Rajasthan, 1984 Cr. LJ 1423 (1428)
2.	Francis Coralie Mullin v. Union Territory Delhi, AIR 1981 SC. 746.
3.	R.K. Garg v.Union of India (1981) 133 ITR 239.
4.	Mithu v.State of Punjab, AIR 1983 SC 473.

**Select Bibliography:**
1.	Barnes, H.B. - Teeters - New Horizons in Criminology.
2.	Vold, G.S. - Theoritical Criminology.
3.	Pillai, K.S. - Criminology.
4.	R. Taft, Donald - Criminology.
5.	Edwin, H. Sutherland and Donald R. Grussey- Principles of Criminology
6.	Horman Mannhaim - Pioneers in Criminology.
7.	Hon, Barren, Mays - Crime and the Social Structure.
8.	Ahmed Siddiqui - Criminology - Problems & Perspectives
9.	Lord Pakenham - Causes of Crime.
10.	S.Venugopala Rao - Facts of Crime in India.
11.	Korm, R.R. and Mc Gorble, LW - Criminology and Penology.
12.	Grunhut - Penal Reforms.
13.	Mandholm - Criminal Justice and Reconstruction.
14.	Garden Rose - The Struggle for Penal reform.
15.	I.L.I. - Essays on Indian Penal Code.
16.	Ben - Penology - Old and New - Tagore Law Lectures.
17.	Elliot - conflicting Penal Theories in Statutory in Criminal Law.
18.	Shamshul Huda - Tagore Law Lectures on Criminal law.
19.	Lawburse - Crime, Its causes and Remedies.
20.	Dequires - Modern Theories of Criminology.
21.	Gillin - Criminology and Penology.
22.	Deccaria - Crime and Punishment.
23.	N.V. Paranjape -अपराधशास्त्र एवं दण्ड प्रशासन

24. M.S. Chauhan -अपराधशास्त्र एवं अपराधिक विज्ञान सिद्धान्त
25. B.L. Babel -अपराधशास्त्र
26. The Criminal Procedure Code.
27. The Constitution of India.

## PAPER - 3.6 (B) INTELLECTUAL PROPERTY LAW

**Max. Marks: 100**                                   **Min. Pass Marks: 36**

### UNIT- I

**Introductory :** The meaning of intellectual property, Competing rationales of the legal regimes for the protection of intellectual property, The main forms of intellectual property : copyright trademarks, patents, designs, The competing rationales for protection of rights in, Copyright, Trademarks, Patents, Design, Trade secrets, Other new forms such as plant varieties and geographical Indians, Introduction to the leading international instrument concerning intellectual property right : the Berne Convention, Universal Copyright Convention, the Paris Union TRIPS the World intellectual Property Right Organization (WIPO) and the UNESCO.

### UNIT - II

**Copyright in India :** Historical evolution of the law, Meaning of copyright, Copyright in literary, dramatic and musical works, Copyright in sound records and cinematograph films, Copyright in computer programme, Ownership of copyright, Assignment of copyright, Author's special right, Notion of infringement, Criteria of infringement, Infringement of copyright by films of literary and dramatic works, Importation and infringement, Fair use provisions, Piracy in internet, Aspects of copyright justice, Remedies, especially, the possibility of Anton pillar injunctive relief in India.

### UNIT- III

**Intellectual Property in Trademarks:** The rationale of protection of trademarks as (a) an aspect of commercial and (b) of consumer rights, Definition and concept of trademarks, Registration, Distinction between trademark and property mark, The doctrine of honest Current User, The doctrine of deceptive similarity, Protection of well-known marks, Passing off and infringement, Criteria of infringement, Standards of proof in passing off action, Remedies.

### UNIT- IV

**Patents (A):** Concept of patent, Historical view of the patents law in India, Patentable inventions with special reference to biotechnology products entailing creation of new forms of life, Patent protection for computer programme, Process of obtaining a patent : application, examination, opposition and sealing of patents : general

introduction, Procedure for filing patents, patent co-operation treaty, Some grounds for opposition, The problems of limited locus standi to oppose, specially in relation to inventions having potential of ecological and mass disasters, Wrongfully obtaining the invention, Prior publication of anticipation, Obviousness and the lack of inventive step, Insufficient description.

## UNIT- V

**Patents (B)**Rights and obligations of a patentee, Patents as chose in action, Duration of patents : law and policy considerations, Use and exercise rights, Right of secrecy, The notion of "abuse" of patent rights, Compulsory licenses, Special Categories, Employee invention : Law and Policy Consideration, International Patents, Transfer of Technology, Know-How and problems of self reliant development, Infringement

**Leading Cases:**
1.  Manu Bhandari v. Kalankar Pictures Pvt. Ltd. AIR (1987) Del.13.
2.  Nac Sahitya Prakash v. Anand Kumar,AIR 1981 All200 at P.203.
3.  Brudaban Sahu v.Rajendra Subudhi, AIR 1986 Orrisa 210 at p.211.
4.  R.G. Anand v. Messers Deluxe Films, AIR 1978 SC 1513 p. 1627.

**Select Bibliography:**
1.  Designs and Patents Act, 1988.
2.  International Copy right and Neighbouring Right - G.M. Stewart.
3.  Indian Copy-right Act, 1957.
4.  Borne Convention Implementation Act, 1988.

## PAPER - 3.6 (C) LAW OF MEDICINE

Max. Marks: 100                                              Min. Pass Marks:36

### UNIT- I

**The Establishment of Indentity of Individuals:** Branding, tatooing, Mutiating, Scars and Moles, Bantillon system: photography: fingerprints: ridge characteristics: Proscopy.

### UNIT- II

**Injuries:** (HURT) : Definition in law (Sec. 319, 320 I.P.C.) Grievous Injury, Classification, Cardinal fracures of different types of injuries, Age of injuries.

**Burns & Scars:** Classification of burns (Depurants), Causes of death after burns, Simple and grievous burns, Area of the body surface in burns and its relationships, Ante-mortem and post-mortem burns.

### UNIT- III

**Ashpyxia and Drowing:** Cause of asphyzia, post-mortem appearances, Various types of violent asphysial deaths like hanging, Strangulation, throttling and traumatic asphyxia, and the post morten appearances commonly seen in these conditions,Drowning - Cardinal post-mortem signs : Cadaveric apasm of hands, Signs

in the air passages, Stomach contents, Sign in the lungs, Demostration of diatoms in the viscera.

## UNIT-IV

**Sexual Offence: Rape:** Definition (Sec 375 I.P.C.), Examination of victim - Anatomy of hymen, Positive signs of rape, Examination of the accused, Medico legal aspects, Sodomy: Examination of the victim, Signs in the habitual passive agent, Examination of the accused,

Examination of Blood Stains: Physical, Chemical & Serological, Blood grouping its basic principles.

## UNIT- V

**Autopsy:** Procedure - Aims & Objects - Difficulties, Problems,Times since death - Description of post- mortem changes, Estimation of time since death from rigor post-mortem staining, putrefaction, adipocere formation nummification changes in the eyes, skin, primary and secondary relaxation. In drowing cases from floatation of the body, In dead bodies after burial From the change in the degree of digestion of stomach contents, from the change of the cerebo spinal fluid and the narrow cells of the sternum, Cause and manner of a death, Ante mortem or post-mortem injuries, Examination of human remains skeletal and multilated remains, Establishment of age, Sex and Stature for the purpose of identity, Infanticide, Definition dead born, still born viable foetus, criteria for separate existence, Exhumation : Rules and Procedure,

8.    Poisons : Classification of poisons, Diagnosis of poisoning. Examination of poisoning case. Brief Toxicology of the following common poisons-Opium, Dhatura Barbivaratcs, Cannabis India, Arsenic, Copper Sulphate, Lead Stryehnine, Cocaine, Alcohol Organo Phosphours Compunds, Carbonmonoxide, Hytiocyanci Acid, Pot Cynide, Phosphorus, Snake bite.

**Select Bibliography:**
1.    Parikh's Text Book of Medical Jurisprudence and Toxicology, by Dr. C.K. Parikh.
2.    Medical Jurisprudence and Toxicology by Jai singh, S. Modi.
3.    Forensic Chemistryand Scientific Criminal Investigation by Lucas A.
4.    B.L.Babel- Medical Jurisprudence (Hindi)

**Leading Cases :**
1.    Sada Shiv Mohan Chandra v.State of Kerala, AIR 1994 SC 565.
2.    Keru Singh v.State of Rajasthan, 1994 Cr. Lj. 187 SC
3.    Jose v.State of Kerala, 1994 SCC (Cr.) 1659
4.    Miss Narayanamma v.State of Karnataka, 1994 SCC 573.
5.    Hemchandra v.State of Haryana, AIR 1995 SC 120.

## PAPER - 3.7 LAND LAWS

**Max. Marks: 100**                                                              **Min. Pass Marks: 36**

**THE RAJASTHAN TENANCY ACT, 1955**
Preliminary Objects and ReasonsDefinitions (S.5) : Agricultural year, Grove holder Grove Land, Improvement, Land,Tenant, Trespasser, Classes of Tenants, (S.14, 15, 17,17-a) Lands on which KhatedariRights do not accrue (S. 16), Primary Rights of tenants (Ss. 31 to 37)Devolution of tenancies, Transfer of tenancies, Exchange of tenancies, Surrender. Abandonment and extinction of tenancies, improvement and trees (Ss. 38 to 87)Groveholders (Ss. 194 to 205)

**UNIT-II**
Grounds for Ejectment of tenants and Remedies for Wrongful ejectment (Ss. 169 to188), Provision for injunction and appointment of Receiver (S. 212), Procedure andJurisdiction of Courts (Ss. 216 to 221), Appeal, Review, Revision, Reference (Ss. 222to 232), Question of tenancy right in Civil Courts (S. 242) Conflict of Jurisdiction (S.243)

**UNIT-III**
**THE RAJASTHAN LAND REVENUE ACT, 1956**
The Board of Revenue (Ss. 4 to 14), Revenue Courts and Officers (Ss. 15 to36),Appeal, Reference, Revision and Review (Ss. 74 to 87); Land : use of AgriculturalLand for Non-.Agricultural purposes (s. 90-A), unauthorised Occupation of Land (S.91), Allotment of Land for Agricultural purpose (S. 101), Survey and Recordoperations: General (Ss. 106 to 109) Boundary Marks (Ss. 110 to 111) Maps and FieldBooks (S .112)

**UNIT-IV**
Record of Rights (Ss. 113 to 121) Mutations (Ss. 122 to 137). Settlement operation:General (Ss.142 to 146), Economic Survey (S.148) Formation of Assessment Circles(S. 149), Soil classification (S.150), Evolution and Modification of rent rates,preparation of rent rate reports. its submission and finalisation (Ss. 151 1 to 167),Tenants option to refuse rent determined and its effect (Ss. 168 to 172), Preparation ofDastoor Ganwai (Ss. 173 to 174), Term of settlement (Ss. 175 to 177), Processes forRecovery of Revenue (S. 228), Writ of demand and citation to appear (Ss. 229 and 229-A), Attachment and Sale of movable property (S. 230), Attachment of the Land (Ss.231 to 233), Sale of defaulters specific Area, Path or estate (Ss. 235 to 253)

**UNIT-V**
**The Rajasthan Rent Control Act, 2001** (Act No. 01 of 2003 as amended by Rajasthan Act No. 21 and 22 of 2005): Definition, ApplicationPreliminary, Revision of Rent,Determination of rent, Tenancy- Limited period tenancy, eviction of tenants, rights of landlord, Restoration of possession of illegally evicted tenant and procedure thereof. Constitution of Tribunals, Jurisdiction, Appeal and Execution, Amenities and Miscellaneous provisions.
**Selected Bibliography :**

1. S.K. Dutta- Rajasthan Tenancy Act, Rajasthan Land Revenue Act, Rent Control in Rajasthan.
2. Mathur & Mathur- Land Laws in Rajasthan.
3. Dr. G.S. Karkara- Land Laws in Rajasthan.

**Leading Cases :**
1. Ugam Raj v. Civil Judge(SD) Sojat City & ors. 2005(6) RRD 2180 (Raj.)
2. Heera Lal v. Rent Tribunal, Bikaner & ors. 2005(7) RRD 2648 (Raj.)
3. Nathu Singh v. Laxman Singh 1995 RRD 124
4. Panne Singh v. Guman Singh 1964 RRD 101
5. Shivshankar v. Murli Sri Bade Mathureshji 1996 RRD 316
6. Bhohra v. Ganesh 1996 RRD 71

## PAPER - 3.8 HUMAN RIGHTS LAW AND PRACTICE

**Max. Marks: 100**                                        **Min. Pass Marks: 36**

### Unit- I

1. **Human Rights : Concept**
   a. Human Rights Meaning and Nature
   b. Human rights in Indian tradition : ancient, medieval and modern
   c. Human rights in western tradition
   d. Development of natural rights
   e. Human Rights in international law and national law

### Unit- II

2. Classification of Human Rights – First, Second and Third Generations : Historical Development

### Unit- III

3. **Human Rights Under International Law**
   a. Universal Declaration of Human Rights (1948)
   b. Covenant of Political and Civil Rights (1966)
   c. Covenant of Economic, Social and Cultural Rights (1966)

### Unit- IV

4. Role of Regional Organizations
   a. European Convention of Human Rights
   b. American Convention on Human Rights
   c. African Convention of Human Rights

### Unit- V

5. Enforcement of Human Rights in Indian Perspective
   a. Role of Supreme Court
   b. Role of High Courts
   c. Role of National Human Rights Commission

d.  Role of State Human Rights Commissions

**Select Bibliography**

D.D.Basu, Human Rights in Indian Constitutional Law, (1994).

Vijay Chitnis,(et.al.). Human Rights and the Law. National and Global Perspectives, (1997).

B.P.Singh Seghal, Law, Judiciary and Justice in India, (1993).

James Vadakkumchery, Human Rights and the Politics in India, (1996).

D.R.Saxena, Tribals and the Law, (1997).

Poornima Advani, Indian Judiciaty: A Tribute, (1997).

Justice Venkataramiah, Human Rights in the Changing World, (1998)

Paramjit S.Jaiswal and Neshtha Jaiswal, Human Rights and the Law, (1996).

## PAPER - 3.9 ARBITRATION, CONCILIATION AND ALTERNATIVE DISPUTES RESOLUTION SYSTEMS

(A)  **Written Paper: 80 marks**                     **Min. Pass Marks : 29**

(B) **Practical Paper: 20 marks**                      **Min. Pass Marks : 07**

The Practical examination shall be conducted by a committee of 2 examiners.In this committee there shall be one internal and one external examiner.

**(A)Written Paper**

### UNIT-I

Arbitration and Conciliation Act, 1996: General provisions: Arbitration agreement; Arbitral Tribunal: Composition and Jurisdiction; Conduct of Arbitral Proceeding.

### UNIT-II

Arbitral awards: Termination of proceedings, setting aside the Arbitral award; Enforcement of Arbitral awards, Appeals; Code of ethics for Arbitrators.

### UNIT-III

Enforcement of Foreign-awards; Geneva Convention International arbitration institutions
Conciliation : conciliators, appointment of conciliators, relationship of conciliators with the parties, settlement agreement status and effect of settlement agreements. Terminations ofconciliation proceedings, resort to judicial proceedings, cost and deposits.

### UNIT- IV

**Alternative dispute & resolution system:** Objects and role of committee for implementation of legal aid schemes (CILAS). The Legalservices authorities act, 1987 (as amended by the act of 2002)- The national legal service authority, State legal service authority and District legal service authority- constitution and functions;

**Lok Adalat-** Organisation, cognizance of cases, award and powers. Permanent Lok Adalat- establishment, cognizance of cases, procedure and award. Study of other alternative dispute resolution system in brief such as Nyay Panchayat and Family courts.

**Leading Cases:**
1.	Sundaram Finance Ltd. v.NIPC India Ltd. (1999) 2 SCC 479
2.	NMTC Ltd. v.Sterlite Industries Ltd. 1996(4) SCC 219
3.	Lotus Investment and Securities v.Pramod S. Tiberwal 1996(2) SCC 579
4.	State of Rajasthan v.Bharat Construction Co. 1998 (4) CCs172 (Raj.)

**Selected Bibliography:**
1.	G.C. Mathur, Arbitration and Conciliation Act, 1996.
2.	S. Krishnamurthy: Law of Arbitration and Conciliation.
3.	P.M.Bakshi: Arbitration Law.
4.	O.P. Tiwari: The Arbitration and Conciliation Act, 1996
5.	Avtar Singh: Law of Arbitration and Conciliation.

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**PRACTICAL PAPER : 3.10**

**DRAFTING, PLEADING, CONVEYANCING**

**AND MOOT COURT TRIAL**

</div>

This paper will consist of following two parts –

| | |
|---|---|
| **(A) Written Paper:80 marks** | **Min. Pass Marks: 29** |
| **(B) Practical Paper: 20 marks** | **Min. Pass Marks: 07** |

The Practical examination shall be conducted by a committee of 2 examiners.In this committee there shall be one internal and one external examiner.

**(A)Written Paper**

<div align="center">

**UNIT- I**

</div>

Pleading: Meaning, Kinds; Fundamental principles of pleading and their exceptions,amendment of pleadings, alternate and inconsistent pleadings Doctrine of set-off:Legal set-off and equitable set-off

<div align="center">

**UNIT- II**

</div>

Drafting of pleadings Civil: Plaints, written statement, Original Petition, Affidavit,Notice, Execution Petitions, Memorandum of Appeal, Execution of Writ Petition. and Judgement writing

<div align="center">

**UNIT- III**

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Criminal complaints, Bail Application, Aceusi Reply, criminal Miscellaneous Petition, Appeal, Reference and Revision.

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**UNIT- IV**

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Conveyancing: Meaning, General Rules of Conveyancing, Salient parts ofconveyancing, rules relating to their drafting

Drafting of Deeds: Partnership deed, mortgage by conditional sale, notice for

eviction, writing of government contract, sale deed, Mortgage Deed, Gift Deed, Lease Deed, Rent Deed, Power of Attorney, Provisory Note and will .

**(B)Practical Paper:**

**(1)    Pre-trial Preparation :** Each student will observe two interviewing session of clients at the advocate office / legal office and record the proceedings in a diary.

**(2)    Participation in Trial Proceedings :** Each student will attend two trials during the session and maintain a record and enter the various steps observed during in a diary.

**(3)    Moot Court :** Each student will participate in two Moot courts

**(4)    Viva-voce:** The Viva-voce examination shall be conducted by a committee of two persons. In this committee there shall be one Internal and one External Examiner. The committee shall award marks on the basis of Court diary, performance at the Moot court and Viva-voce Examination.

The division of marks will be as under:

(1)    Record maintained by the student          5 marks
(2)    Participation in Moot court                5 marks
(c)    Viva-voce                                  10 marks

# MAJARAJ GANGA SINGH UNIVERSITY, BIKANER

SYLLABUS

SCHEME OF EXAMINATION AND

COURSES OF STUDY

**FACULTY OF BACHELOR OF LIBRARY SCIENCE**

**BACHELOR OF LIBRARY SCIENCE - 2022**

Maharaja Ganga Singh University

# Maharja Ganga Singh University, Bikaner
### Faculty of Education
## BACHELOR OF LIBRARY AND INFORMATION SCIENCE
### (Under Choice Based Credit System)

### 2021-22

### NEP and Learning Outcome-based Curriculum Framework (LOCF)

**Vision**

To build responsive, responsible, sensitive, creative and thoughtful citizens with a comprehensive understanding of regional, national and international perspectives.

**Mission**

To strive towards the educational, cultural, economic, environmental and social advancement of the region and the nation at large by providing multidisciplinary liberal education involving arts, sciences, social sciences, education, law and commerce & Management and quality programmes which inculcate and enhance students' creative and innovative insights, equipping them with both professional and vocational skills, leading to Bachelors', Masters', Professional, Vocational and Doctorate Programmes.

**Programme Objectives(POs):**
1. To give the students an understanding of the basic principles and fundamental laws of Library and Information Science and to enable him/her to understand and appreciate the functions and purposes of the Library in the changing social and academic environment.
2. To train the students in the techniques of librarianship and management of libraries.
3. To acquaint the students with the organizations and development of the universe of knowledge and research methods.
4. To make the students proficient in the theory and methods involved in information storage and retrieval.

**Programme Specific Outcomes(PSOs):**

**PSO 1: Disciplinary knowledge:** Capable of demonstrating comprehensive knowledge and understanding of major concepts, principles, theories and laws of various subjects in Library and Information Science and other related fields of study, including broader interdisciplinary subfields such as management, economics, information and communication technologies, etc.

**PSO 2**: **Professional Skills** – Graduate will be able to develop efficient and effective professional skills using modern techniques of library and information science.

**PSO 3: Digitally literate:** Capable of using digital technology for communication purpose, for library housekeeping operations, and for searching information from OPAC, Internet and online databases.

**PSO 4: Librarianship as a profession**– Ability to serve the information for advancement of society and self.

**PSO 5: Core Knowledge:** demonstrate advanced knowledge of LIS theories, principles, and practices.

**PSO 6**: **Intellectual Skill:** demonstrate an ability to evaluate, critically analyze, and synthesize information from multiple sources

**PSO 7: Technology Skills:** able to employ technology to analyze, design, and provide solutions to information problems

1. **Course Pattern**: To enhance the students in the skills of information knowledge processing, organization and retrieval; to train them in the management of library & information centre; to enable the students to understand and appreciate the purposes of library & information centres in the changing social, cultural, technological and economic environment; to train the students in the advance information science and technology. The course pattern, curricular structure is as per the UGC Model Curriculum and CBCS.

2. **Duration:** The duration of the course leading to the Degree of Bachelor of Library and Information Science (B.L.I.Sc.) is of **two semesters** in one academic year, July to June (under Faculty of Education).The examination shall, ordinarily, be held in the month of December and May or on such dates as may be fixed by the University.

3. **Eligibility**: A candidate who fulfils the following conditions shall be eligible to seek admission in the first semester of the course:
   Who has passed **Graduation/Post Graduation** with at least **45% marks** of a University recognized as equivalent there to. The admission of reserved category candidate and other benefits shall be as per the rules concerned, contained in the university admission policy.

4. **Nature**: Professional programme, Self-finance course. Non-collegiate candidates are not eligible as the practical, internship, etc. are involved.

5. **Number of Seats**: 30

6. **Medium**: The medium of instructions is Hindi preferably; candidate may attempt in English / Hindi in test and examination.

7. Candidate must fulfil other conditions as contained as per the university rules.
8. **Provisional Classes in Semester – II**: A candidate, whose result is declared late for no fault of his/her, may attend classes for the next semester, provisionally, at his/her own risk and responsibility, subject to his/her passing the concerned examination. In case, a candidate fails to pass the concerned examination, his/her attendance/internal assessment in the next semester in which he/she was allowed to **attend classes provisionally** shall stand cancelled.

9. **Internal Assessment**: Twenty per cent (20%) marks, in each theory and practical paper are assigned for internal assessment. The following criteria shall be followed for award of internal assessment:

| Sr. No. | Criteria | Max Marks |
|---------|----------|-----------|
| 1 | Midterm Exam/Term papers Tests (1 x 5 and 2 x 5) | 15 |
| 2 | Overall performance including attendance | 05 |
| | Total = | 20 |

The Head / In-Charge of the Department shall forward the Internal Assessment marks to the Controller of Examinations, at least one week before the commencement of the examination. The internal assessment awards of a candidate who fails in any examination shall be carried forward to the next examination concerned.

10. **Internship**: Every candidate shall be required to undergo Skill Enhancement **Internship/Training** for a period of **two weeks** (5 hours per day, 12 working days) in the University Central Library/Library of repute (in the city), as decided by the Head of the Department for the Course FE-LIS-CC-106. The candidate shall submit a computer-printed internship / training report to the Department after its successful completion. Initial part of this report shall be 'Job diary' based on the works done. It consist2 credits on the basis of contribution at the training place, training report and attendance (duly certified by the Head / In-Charge of the Library / Information Centre where the candidate attended the training). This work shall be accessed and graded by the Department.

11. **Evaluation** : Semester examination shall be conducted by the University for All the Courses offered in the Department except for the Viva-voce / Seminar/ Internship / Training. Every student shall be examined in the subject (s) as laid down in the syllabus.

1. The question papers will be set by the External Examiners for the Theory papers;
2. The practical examinations shall be assessed by Internal (Head/nominated) and External Examiners both, for the practical papers as scheduled by the university;
3. Assessment of Seminars: A seminar leader will be nominated by the Head of the Department to act as a guide to the students. Students will be assigned topics for seminar; they will present an Abstract not exceeding 500 words along with a few important references. The seminar leader will give schedule for providing abstracts, showing presentations to him/her, date and time of the final presentation and submission of the write-up of the seminar. Presentations will be assessed in presence of the faculty, students and invited teachers.
4. The minimum percentage of marks to pass the examination in each semester shall be 40% in each written, practical and internal assessment separately.

B.L.I.Sc. Degree shall be awarded to the candidate on successful completion of the semesters. A list of successful candidates shall be prepared on the basis of aggregate marks obtained in all the two semester examinations. It shall be classified in division as under:

(a) Those who obtain 75% or more : 1$^{st}$ Division with Distinction
(b) Those who obtain 60% or more but less than 75% : 1$^{st}$ Division
(c) Those who obtain 50% or more but less than 60% : 2$^{nd}$ Division

The grace marks, if any, shall be awarded as per University rules concerned thereof. A student shall not be permitted to repeat any course only for the purpose of improving the grade. Result will be prepared as per the CBCS rules of the university.

# Maharja Ganga Singh University, Bikaner
## BACHELOR OF LIBRARY AND INFORMATION SCIENCE
(Under Choice Based Credit System)
### SCHEME OF EXAMINATION: B.L.I.Sc. 2021-22(Two Semesters–One Year)
All the papers with their parts are compulsory for all the candidates.

### Semester - I

| Course Code | Type | Titles | Theory | Practical | Internal | Total | L | T | P | Total | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FE-LIS-CF-100 | CF | Foundations of Library and Information Science | 80 | - | 20 | 100 | 3 | 1 | - | 4 | 4 |
| FE-LIS-CC-101 | CC | Knowledge Organization: Classification (Theory) | 80 | - | 20 | 100 | 3 | 1 | - | 4 | 4 |
| FE-LIS-CC-102 | CC | Knowledge Organization: Classification (Practical) | - | 80 | 20 | 100 | 2 | 1 | 5 | 8 | 4 |
| FE-LIS-CC-103 | CC | Foundation Course: Information and Communication Technology (Theory) | 80 | - | 20 | 100 | 3 | 1 | - | 4 | 4 |
| FE-LIS-CC-104 | CC | Foundation Course: Information and Communication Technology (Practical) | - | 80 | 20 | 100 | 2 | 1 | 5 | 8 | 4 |
| FE-LIS-CC-105 | CC | Seminar | - | - | - | - | - | 2 | - | 2 | 2 |
| FE-LIS-CC-106 | SK | Skill Enhancement : Internship | - | - | - | - | - | 2 | - | 2 | 2 |
| | | Total = | 240 | 160 | 100 | 500 | 10 | 9 | 10 | 32 | 24 |

### Semester – II

| Course Code | Type | Titles | Theory | Practical | Internal | Total | L | T | P | Total | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FE-LIS-CF-200 | CF | National and Human Value | - | - | - | - | 2 | | 2 | 4 | 4 |
| FE-LIS-CC-201 | CC | Knowledge Organization: Cataloguing (Theory) | 80 | | 20 | 100 | 3 | 1 | - | 4 | 4 |
| FE-LIS-CC-202 | CC | Knowledge Organization: Cataloguing (Practical) | - | 80 | 20 | 100 | 2 | 1 | 5 | 8 | 4 |
| | | Discipline Specific Electives (Any one out of the two): | | | | | | | | | |
| FE-LIS-CC-203A | CE | Management of Academic Library & Information System | 80 | - | 20 | 100 | 3 | 1 | - | 4 | 4 |
| FE-LIS-CC-203B | CE | Management of Public Library& Information System | | | | | | | | | |
| | | Discipline Specific Electives (Any one out of the two): | | | | | | | | | |
| FE-LIS-CC-204A | CE | Information Sources &Systems in Sciences | 80 | - | 20 | 100 | 3 | 1 | - | 4 | 4 |
| FE-LIS-CC-204B | CE | Information Sources & Systems in Social Sciences | | | | | | | | | |
| FE-LIS-CC-205 | CC | Seminar | - | - | - | - | - | 2 | - | 2 | 2 |
| | | Total = | 240 | 80 | 80 | 400 | 13 | 6 | 7 | 26 | 22 |
| | | Grand Total = | 480 | 240 | 180 | 900 | 39 | 11 | 22 | 68 | 46 |

Note: Elective Courses: Choose any one out of the FE-LIS-CC-203A/B and FE-LIS-CC-204A/B.

| Abbreviation | Description |
|---|---|
| CBCS | Choice Based Credit System |
| CC | Core Course Compulsory |
| CF | Core Foundation Course |
| SK | Skill Enhancement Course |
| L | Lectures |
| T | Tutorial |
| P | Practical |
| FE | Faculty of Education |
| CE | Core Elective Course |

# Learning Outcome Index

## Programme Outcomes (PO) and Programme Specific Outcomes (PSO)

| PO | PSO-1 | PSO-2 | PSO-3 | PSO-4 | PSO-5 | PSO-6 | PSO-7 |
|------|-------|-------|-------|-------|-------|-------|-------|
| PO-1 | X | | X | X | X | X | |
| PO-2 | | X | X | | X | X | X |
| PO-3 | X | | X | X | | X | X |
| PO-4 | X | | X | X | | X | X |

# BACHELOR OF LIBRARY AND INFORMATION SCIENCE
(Under Choice Based Credit System)
## SYLLABUS
## Semester– I

**FE-LIS-CF-100:** **Foundations of Library and Information Science**

Maximum marks: 80
Pass marks: 32
Time: 3Hrs.

Note: The paper is divided into 4 units. The question number 1 of the paper shall be compulsory; consisting of 8 very short answer type questions for 2 marks each; spread over all the units; to be answered in a word / one sentence / maximum 30 words. The question numbers 2 to 5 shall be unit wise; long answer type questions for 16 marks each; to be answered within 800 words; required to attempt only 01 question from each unit.

## OBJECTIVES OF THE COURSE:
· To make students appreciate the basic philosophy and ethics of librarianship.
· To understand the role and evolution of library as a social institution.
· To know about various types of libraries, their nature, objectives and services.
· To create awareness about the role of professional library associations.
· To understand the concept of Resource Sharing and extension activities in libraries. ·
To generate awareness about legal, political and ethical aspects of information and its use.

## COURSE OUTCOMES (CO):
● To make the students aware about types of libraries and their functions.
● To acquaint the students with fundamental laws, legislations and associations.

**Unit – I**: **Libraries as Social Institutions**
Social and Historical Foundation of Library
Different Types of Libraries –Academic, Public, National, Special Libraries
Characteristics, Objectives, Structure and Functions Development of Libraries with Special Reference to India
Library and Information Science Education in India
Role of Library in Formal and Informal Education

**Unit – 2: Laws of Library and Information Science**
Laws of Library Science
Implications of Five Laws of Library Science in Digital Environment

**Unit – 3: Library Legislation and Library Profession**
Library Legislation – Need and Essential Features,
Library Legislations in India
Intellectual Property Rights - Copyright Act, Delivery of Books Act.

**Unit – 4: Professional Associations and Promoters of Library and Information Science**
National Associations – ILA and IASLIC
International Associations - ALA and IFLA
National Level Promoters – Raja Ram Mohan Roy Library Foundation, UGC,
International Level Promoters – UNESCO

**RECOMMENDED BOOKS:**

Amudhavalli, A. & Singh, Jasmer (2000). Challenges and Changes in Librarianship, New Delhi: B. R. Publishing Corporation.

Baker, David. (2011). Libraries and Society: Role, Social Responsibility, and Future Challenges. Oxford: Chandos Publishing.

Batt, Chris. (1998). Information Technology in Public Libraries. London: Library Association.

Feather, John. (2004). The Information Society: A study of continuity and changes. Landon: Facet Publishing.

Grag, R.G. and Tamrakar, Amit (2011). Modern Library Management. Medallion Press, Ludhiana.

Khanna, J. K. (2003). Library and Society. New Delhi: Ess Ess Publications.

Krishna Kumar (1987). Library Administration and Management. Delhi, Vikas.

Kumar, P.S.G. (2003). Foundations of Library and Information Science. New Delhi: B. R. Publishing.

Kumar, S. & Sah, Leena. (2000). Public Library Act in India, New Delhi: Ess Ess Publications.

M. Esperanza A. C. (2004). Perspective of Library Movement in India. New Delhi: B R Publishing Corporation.

Mahapatra, P. (1997). Library Management. Calcutta, World Press.

Mittal, R.L. (1984). Library Administration: Theory and Practice. New Delhi, Metropolitan.

Paliwal, P.K. (2000). Compendium of Library Administration. New Delhi, ESS ESS.

Prasher, R.G. (1993). Developing Library Collection. New Delhi, Tata McGraw-Hill.

Ranganathan, S. R. (1988). The Five Laws of Library Science. New Delhi: Sarada Ranganathan Endowment for Library Science.

Ranganathan, S.R. (1954). Library Administration. Bangalore: Sharada Ranganathan Endowment for Library Science

**FE-LIS-CC-101: Knowledge Organization: Classification (Theory)**

Note: The paper is divided into 4 units. The question number 1 of the paper shall be compulsory; consisting of 8 very short answer type questions for 2 marks each; spread over all the units; to be answered in a word / one sentence / maximum 30 words. The question numbers 2 to 5 shall be unit wise; long answer type questions for 16 marks each; to be answered within 800 words; required to attempt only 01 question from each unit.

**OBJECTIVES OF THE COURSE:**
・To understand the importance of library classification in organization of knowledge.
・To know the elements of library classification.
・To understand the formation of subjects in the Universe of Subjects.
・To be familiar with major schemes of classification.

**COURSE OUTCOMES (CO):**
- To make the students acquainted with the process of knowledge Organization.
- To train students about the tools and techniques of knowledge Organization
- To develop skills in subject analysis and proficiency in using standard schemes of classification

**Unit – 1: Library Classification**

Library Classification- Meaning, Definition, Need and Purpose,

Enumerative Classification, Almost Enumerative Classification, Almost Faceted Classification,

Detailed Study of Colon Classification, Dewey Decimal Classification - Sailent Features.

Standard Schemes of Classification and their historical developments (CC, DDC),

**Unit – II: Laws and Principles of Classification**
Law of interpretation, Law of impartiality, Law of Symmetry, Law of parsimony, Law of Local Variation and Law of Osmosis.
Canon of Characteristics,
Principles of Helpful Sequence.

**Unit – III: Devices and Notation in Classification**
Devices in CC and DDC,

 Notation,

Call Number – class number, book number and collection number.

**Unit – IV: Main Class**
Canonical Class and Basic Class. Five Fundamental Categories -PMEST,

Isolates, Common Isolate-Kinds of Common Isolates,

Phase Relation - Inter Subject, Intra Facet and Intra Array.

**RECOMMENDED BOOKS:**

Broughton, Vanda. (2004). Essential Classification. London: Facet Publishing.

Dhiman, A. K. & Yashoda Rani. (2005). Learn Library Classification. New Delhi: Ess Ess.

Husain, Sabahat. (2004). Library Classification: Facets and Analysis. Delhi: B. R. Publishing.

Jennex, Murray E. (2008). Knowledge Management: Concepts, Methodologies, Tools andApplications. New York: Information Science Reference.

Kao, Mary L. (2003). Cataloguing and Classification for Library Personnel. Mumbai: Jaico.

Kumar, P. S. G. (2003). Knowledge Organization, Information Processing and Retrieval Theory.Delhi: B. R. Publishing.

Pathak, L. P. (2000). Sociological Terminology and Classification Schemes. New Delhi: MittalPublications.

Ranganathan, S. R. (2006). Philosophy of Library Classification. Bangalore: Ess Ess.

Singh, Sonal. (1998). Universe of Knowledge: Structure & Development. Jaipur: Raj

Publishing. Sood, S. P. (1998). Universe of Knowledge and Universe of Subjects. Jaipur: G. Star Printers.

Taylor, A. G. (2007). Introduction to Cataloguing and Classification (10th ed.). New Delhi:

Maximum marks: 80
Pass marks: 32
Time: 3Hrs.

**OBJECTIVES OF THE COURSE :**

・To develop skills of classification.
・To develop skills in subject analysis.
・To develop proficiency in using Colon Classification and Dewey Decimal Classification to construction Class Numbers for documents of different disciplines / subjects.

**COURSE OUTCOMES (CO):**
- To familiarise with the process of classification
- To provide practical training about classification of the documents using the Dewey Decimal Classification (DDC) scheme and Colon Classification.

**Note:**

Classification of documents using "Colon classification (6$^{th}$rev ed.), Ranganathan, Book Number Formula" and Dewey Decimal Classification (19$^{th}$ ed..), representing simple, compound and complex subjects

The paper will be divided into 2 parts:

Part-I: Colon Classification (6$^{th}$rev ed.)

Part-II: Dewey Decimal Classification.

In each part, 3 questions will be set as detailed below:

**Part-I : Colon Classification (CC)**

All questions are compulsory                                      40 Marks

Q.-1   Prepare Class Number using Ranganathan Book Number of

Q.-1    Five Titles out of Eight                                      10Marks

          (Simple title with Basic class & facets)

Q.-2   Four title out of Six.                                      14Marks

          (Titles having Rounds & Levels of facets, system & specials)

Q.-3    Prepare class numbers of Two titles out of Four.          16 Marks

        (Titles using Devices, Common Isolates, Phase Relation)


                            Part-II: DDC

All questions are compulsory                                 40 Marks

Q.-4    Five titles out of Eight  to be classified:              10Marks

        (Simple title)

Q.-5    Four titles out of Six to be classified:                14Marks

        (Title using Table, standards, Table Area sub divisions, subject
        devices etc.)

Q.-6    Two titles out of Four to be classified:                16 Marks

        (Title using various tables & devices etc.)


**RECOMMENDED BOOKS:**

Comaromi, J. P., Warren, M. J. & Dewey, Melvil. (1982). Manual on the Use of the Dewey Decimal Classification. Forest Press.
Dewey Decimal Classification. (2011). 23rd edition. Ohio: OCLC.
Dhyani, Pushpa. (2006). Classifying with Dewey Decimal Classification. New Delhi: Ess Ess.
Khan, M. T. M. (2005). Dewey Decimal Classification. New Delhi : Shree Publishers
Mary, Mortimer. (2007). Learn Dewey Decimal Classification (Edition 22). Friendswood, US: Total Recall Publications.
Ranganathan, S.R. (1963). Colon Classification. Sarada Ranganathan Endowment, Bangalore.

**FE-LIS-CC-103 :**        **Information and Communication Technology (Theory)**

Note: The paper is divided into 4 units.  The question number 1 of the paper shall be compulsory; consisting of 8 very short answer type questions for 2 marks each; spread over all the units; to be answered in a word / one sentence / maximum 30 words.   The question numbers 2 to 5 shall be unit wise; long answer type questions for 16 marks each; to be answered within 800 words; required to attempt only 01 question from each unit.

**OBJECTIVES OF THE COURSE :**

・To acquaint the students with the basic concepts of computers technology.
 ・To acquaint the students with the basic concept of computer networks.
・To develop familiarity with some library management software.
 ・To understand various aspects of library automation.

**COURSE OUTCOMES (CO):**
- To acquaint the students with the basic concepts of computers.
- To understand various aspects of library automation.
- To develop skills in using computers technologies.

Unit-I        **Fundamentals of Computers**

Historical development of computer. Generation of computer**.** Classification of computers: Super, Mainframe, Mini & Micro. Basic Components of computer: Input-Output device, CPU, Storage Device. Definition, Need, Components, scope, Objectives**.** Impact of IT on Society

Unit-II        **Library Automation and Information Technology**

Concept, Planning and Implementations. Inhouse operations: Acquition, circulation, serial control, OPAC. Library Automation Software Packing: Their Study & Features.

Unit-III        **Digital Libraries**

Genesis, Definition, Objectives, Scope. Characteristics and Nature of Collection of Digital Library

Unit-IV        **Library & Information Centers Networking**

History, Concepts and Methods.  LAN, WAN & MAN. Specialized Networks: NICNET, INFLIBNET, DELNET.  Internet and Intranet

**RECOMMENDED BOOKS:**
Arora, Ashok & Bansal, Shefali. (2000). Computer Fundamentals. New Delhi: Excel Books.
Basandra, Suresh K. (1999). Computer Today. New Delhi : Galgotia Publications.
Matthew, Neil & Stones, Richard. (2008). Beginning Linux Programming. New Delhi : Wiley, India.
Sinha, Pradeep Kumar & Sinha, Priti. (2007). Computer Fundamentals. New Delhi : BPB Publication.
Stallings, William. (2007). Computer Networking with Internet Protocols and Technology.

Delhi : Pearson Education.

Maximum marks: 80
Pass marks: 32
Time: 3Hrs.

Note: Hands on experience with computer operation shall be preferred. The students shall be assessed by viva-voce, practical steps in the examination.

**OBJECTIVES OF THE COURSE:**

• To acquaint the students with the basic concepts of computers technology.
• To acquaint the students with the basic concept of computer networks.
• To develop familiarity with some library management software.
• To understand various aspects of library automation.
 • To know how computers can be used in libraries.
• To discuss impact of computer technology in libraries.

**COURSE OUTCOMES (CO):**

- To provide knowledge about basic of ICT.
- To introduce students with library automation and software packages

**Unit 1: System Software: WINDOWS Operating System**

Basics such as Desktop, My Computer, Control Panel, Windows Explorer, Accessories - Calculator and Paint.

**Unit 2: Application Software: MS Word, MS PowerPoint, MS Excel**

MS Word - Standard Toolbars, Creating a Document, Editing a Document, Formatting a Document, Mail Merge, Printing, etc.

MS PowerPoint - Creating Presentation Slides,  Animation, Formatting / Adding Graphics, Slide Show, Customizing and Printing.

   MS Excel - File creation, Editing, Inserting,  Formatting, Printing, etc.

**Unit 3: Hands on experience of Library Management Software and Security**
      **System.**
       SOUL, RFID System.
**Unit 4:   Viva Voce**

**RECOMMENDED BOOKS:**

Courter, G. and Marquis, A. (2005). Mastering Microsoft Excel 2002. New Delhi: BPB Publishers.
Cusumano,  M. A. and Selby, R. W. (2003). Microsoft Secrets. London: Profile. Haag, Stephen. (2002). Microsoft Office XP. Boston: McGraw-Hill.
Johnson, O. and Hanson, R. (2003). Microsoft Word 2002 manual for Gregg College keyboard & document processing. New York: McGraw-Hill.

Levine, John R. and Young, Margaret Levine. (2007). Windows Vista: the complete reference. New Delhi: Tata McGraw-Hill.

www.inflibnet.ac.in

**FE-LIS-CC-105:** **Seminar**

Issues concerned with librarianship, information science / systems / services / networks, automation, networking, digitization, e-learning and relevant aspects.(Details at point 11.3 – initial pages)

**FE-LIS-SK-106:** **Skill Enhancement: Internship** (Details at point 10 – initial pages)

**BACHELOR OF LIBRARY AND INFORMATION SCIENCE**
(Under Choice Based Credit System)

SYLLABUS
**Semester – II**

**FE-LIS-CF-200**           **National and Human Values**

## Objectives:

1. To inculcate national and human values in the Students.
2. To enable the students imbibe the Indian cultural ethos.
3. To inculcate the spirit of Patriotism so that the Students develop a sense of strong bond with the nation.
4. To enable the Students grow into a citizen possessing civic sense.

## Outcomes:

On the completion of the course the students shall be able to

(i) Attain the civic skills enabling him/her to become a well-behaved citizen of the country.
(ii) Imbibe and spread the feelings of devotion and dedication.

## Assessment and Evaluation:

The Students shall be assessed and evaluated as per the schedule given below –
1. Project Report / Case Study (in 5000-7000 words handwritten) – 75%
2. Viva-voce  - 25%

The topics for the Project Report / Case Study shall be allotted by the Nodal Department (decided jointly with NSS wing under the supervision or IQAC) in consultation with the Department concerned. The Candidate shall submit the Report by the date fixed for the said purpose. It shall then be followed by a Viva-voce Examination. The whole evaluation shall be done by the Departmental Internal Faculty in consultation with the Nodal Department. It is a non-creditable Paper. The Student will have  to score simply a qualifying score/grade as specified in the CBCS rules.
         The candidate will have to qualify the paper by the time He / She qualifies for the Programme. He/She can avail maximum 3 chances along with the Semester Examinations.

### Unit-I

1. NCC – Introduction, Aims, NCC Flag, NCC Song, NCC Administration, Raising of NCC in Schools/Colleges, NCC: Rank, Honours and Awards, NCC Training, NCC Camps, NCC Examinations, Incentive and Scholarship for Cadets.

2. Importance of Discipline in life, Aims and Merits of Discipline, Problems related to Indiscipline and Solutions.

3. Drill – Definition, Principles of Drill, Bad habits in drill, Words of Command, Drill Movements, Arms Drill, Squad Drill, Guard of Honour, Ceremonial Drill, Guard Mounting.

4. Contribution of NCC in Nation Building.

## Unit-II

1. Armed Forces – Control Command, Organization of Armed Forces, Weapons of Army, Navy and Air Force, Training institutes, Honours and Awards, Recipients of Param Veer Chakra, Badges of Ranks.

2. Commission in Armed Forces – Recruitment in Armed Forces ,Commission in Technical, Non Technical and Territorial Forces.

3. Weapon Training – 0.22 Rifle, 7.62 Rifle, 7.62 SLR (Self Loading Rifle), 5.56 MM I.N.S.A.S. Rifle, L.M.G. (Light Machine Gun), Stan Machine Carbine, 2" Mortar, Grenade, Pistol, Various types of Firing, Range Procedure and Range Drill.

4. Military History and Geography, Field Craft, Field Engineering, Battle Craft.

## Unit-III

1. Obstacle Training. Adventure Training, Self Defense, Physical Posture Training.

2. Social Service, Disaster Management, Health and Hygiene, First Aid.

3. Leadership, Personality Development, Decision Making, Motivation, Duty and Discipline, Morale.

## Unit IV

1. Value system – The role of culture and civilization-Holistic living
2. Balancing the outer and inner – Body, Mind and Intellectual level- Duties and responsibilities
3. Salient values for life- Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity , and inclusiveness
4. Self-esteem and self confidence
5. punctuality – Time, task and resource management ,Team work
6. Positive and creative thinking.

## Unit V

1. Universal Declaration of Human Rights
2. Human Rights violations
3. National Integration – Peace and non-violence (in context of Gandhi, Vivekanad)

4. Social Values and Welfare of the citizen
5. The role of media in value building
6. Fundamental Duties
7. Environment and Ecological balance – interdependence of all beings – living and non-living.

**RECOMMENDED BOOKS:**

1. Hand Book of NCC : Major R C Mishra & Sanjay Kumar Mishra

2. National Security: K. Subramanyam

3. ASEAN Security: Air Comdr. Jasjit Singh

4. Indian Political System, Dr . Pukhraj Jain & Dr. Kuldeep Fadiya

5. हैण्ड बुक ऑफ एनसीसी, मेजर आर. सी. मिश्र एवं संजय कुमार मिश्र

6. अन्तर्राष्ट्रीय राजनीतिः वी. एल. फाड़िया

7. भारतीय राजव्यवस्था, डॉ. पुखराज जैन, डॉ. कुलदीप फड़िया

8. राष्ट्रीय प्रतिरक्षाः डॉ. हरवीर शर्मा, जयप्रकाश नाथ कंपनी, मेरठ

9. राष्ट्रीय सुरक्षाः डॉ. लल्लन सिंह, प्रकाश बुक डिपो, बरेली

10. राष्ट्रीय सुरक्षाः डॉ. नरेन्द्र सिंह, प्रकाश बुक डिपो, बरेली

11. राष्ट्रीय सुरक्षाः डॉ. पाण्डेय व पाण्डेय, प्रकाश बुक डिपो, बरेली

12. राष्ट्रीय रक्षा व सुरक्षाः डॉ. एस. के. मिश्र, मार्डन पब्लिशर्स, जालंधर

13. NCERT, Education in Values, New Delhi, 1992.
14. M.G.Chitakra: Education and Human Values, A.P.H. Publishing Corporation, New Delhi,2003.
15. Chakravarthy, S.K.: Values and ethics for Organizations: Theory and Practice, Oxford University Press, New Delhi, 1999.
16. Satchidananda, M.K.: Ethics, Education, Indian Unity and Culture, Ajantha Publications,Delhi, 1991.
17. Das, M.S. & Gupta, V.K.: Social Values among Young adults: A changing Scenario, M.D.Publications, New Delhi, 1995.
18. Bandiste, D.D.: Humanist Values: A Source Book, B.R. Publishing Corporation, Delhi,1999.
19. Ruhela, S.P. : Human Values and education, Sterling Publications, New Delhi, 1986.
20. Kaul, G.N.: Values and Education in Independent Indian, Associated Publishers, Mumbai,1975.
21. Swami Budhananda (1983) How to Build Character A Primer : Ramakrishna Mission, NewDelhi.
22. A Cultural Heritage of India (4 Vols.), Bharatiya Vidya Bhavan, Bombay. (SelectedChapters only) For Life, For the future : Reserves and Remains –UNESCO Publication.
23. Values, A Vedanta Kesari Presentation, Sri Ramakrishna Math, Chennai, 1996.
24. Swami Vivekananda, Youth and Modern India, Ramakrishna Mission, Chennai.
25. Swami Vivekananda, Call to the Youth for Nation Building, Advaita Ashrama, Calcutta.
26. Awakening Indians to India, Chinmayananda Mission, 2003.


**FE-LIS-CC-201:   Knowledge Organization: Cataloguing (Theory)**

Maximum marks: 80
Pass marks: 32
Time: 3Hrs.

Note: The paper is divided into 4 units.  The question number 1 of the paper shall be compulsory; consisting of 8 very short answer type questions for 2 marks each; spread over all the units; to be answered in a word / one sentence / maximum 30 words.   The question numbers 2 to 5 shall be unit wise; long answer type questions for 16 marks each; to be answered within 800 words; required to attempt only 01 question from each unit.

**OBJECTIVES OF THE COURSE :**

· To understand the objectives, functions and types of library catalogues.
· To understand the fundamentals of cataloguing and catalogue entries.
 · To understand the principles and practices of document description.
· To understand the role of cataloguing in retrieving library material

**COURSE OUTCOMES (CO):**
 - To be acquainted with the process of Library Cataloguing and metadata and its standards
 - To understand Bibliographic Formats and Standards, deriving subject headings
 - To have hands on practice of cataloguing of different types of documents
 - To develop skills in subject analysis and proficiency in using standard Subject cataloguing.


**Unit – 1: Library Cataloguing**
Library Cataloguing- Need, Objectives and Types and Similar other tools: Bibliographies, indexes, accession register and shelf list.

Physical and Inner forms of Catalogue including OPAC.


**Unit – II: Types of Entries**
Types of Entries in CCC and AACR-2: Main Entry, Added Entries,

Normative Principles of Cataloguing.

**Unit – III: Subject Cataloguing**
Need, Purpose and functions, Principles of subject headings,

Types of Subject Cataloguing Methods for derivation of subject headings: Chain Procedure, Sears List of Subject Headings.

**Unit – IV: Codes and Standards**
 Comparative Study of Classified Catalogue Code with Additional Rules for Dictionary Catalogue Code and Ango-American Cataloguing Rules-2(AACR-2).

Centralized and Cooperative Cataloguing.

Current Trends in Bibliographic Standardization, Description and Exchange: ISBD(G), ISBD(S), MARC.

**RECOMMENDED BOOKS:**

Aswal, R. S. (2004). MARC 21: Cataloging Format for 21st Century. New Delhi: Ess Ess.
Dhawan, K. S. (1997). Online Cataloguing Systems. New Delhi: Commonwealth Publication.
Girija Kumar & Krishan Kumar. (2004). Theory of Cataloguing. New Delhi: Vikas
Gredley, Ellen & Hopkinson, Alan (1990). Exchanging Bibliographic Data: MARC and other International Formats. Ottawa: ALA.
Hagler, Ronald & Simmons, Peter. (1991). The Bibliographic Record and Information.
Kao, Mary L. (2003). Cataloguing and Classification for Library Personnel. Mumbai: Jaico.
Leigh, Gernert. (2003). A Text Book of Cataloguing. New Delhi: Dominant Publishers.
Mitchell, Anne M. & Surratt, Brian E. (2005). Cataloguing and Organizing Digital Sources. London: Facet Publishing.
Pandey S. K. (2001). Library Cataloguing Theory. New Delhi: Sahitya Prakashan
Singh, S. N. & Prasad, H. N. (1985). Cataloguing Manual AACR-II. New Delhi: B. R. Publishers.
Sood, S. P. (1999). Theory of Library Cataloguing. Jaipur: Raj Publishing House.
Taylor, A. G. (2007). Introduction to Cataloguing and Classification (10th ed.). New Delhi: Atlantic.
Viswanathan, C. G. (2008). Cataloguing Theory and Practice. New Delhi: Ess Ess.

<div align="right">
Maximum marks: 80<br>
Pass marks: 32<br>
Time: 3Hrs.
</div>

Practical Cataloguing of under mentioned types of document for making Classified Catalogue and a Dictionary Catalogue by using Classified Catalogue Code (5<sup>th</sup> Edition with the Amendments) and the 'Anglo-American Cataloguing Rules' II edition respectively along with 'Sears List of Subject Heading' for getting subject headings.

**OBJECTIVES OF THE COURSE :**

・To develop skills of cataloguing.

• To understand the rules and practices of document description for Books and journals according to Anglo American Cataloguing Rules-2 and CCC.

• Preparing Catalogue Entries (Main, Added and Reference Entries) for Book and journals using Anglo American Cataloguing Rules- Second revised edition and CCC.

**COURSE OUTCOMES (CO):**

- To familiarise with the process of cataloguing.

- To provide practical training about cataloguing of the documents using the CCC and AACR-II.

1. Books involving Personal, Shared and Collaborator (s) Authorship.
2. Books involving Pseudonymous Author.
3. Books involving Corporate Authorship.
4. Ordinary composite books.

5.    Multivolume books

6.    Periodical Publications (Simple).

**Note:** Complicated Foreign Personal Names, complicated periodicals and pseudoseries are to be omitted. This paper will have 5 tiles in 3 sections . All are compulsory to attempt.

First 2 titles out of three will be catalogued according to CCC (Ed 5$^{th}$ with Amendments) with 15 marks each.  Next two titles out of three will be catalogued according to AACR-II with 15 marks each. The last fifth title will be a Simple Periodical to be catalogued either according to CCC or AACR-II with 20 marks.

**RECOMMENDED BOOKS:**

1. ALA and others. Anglo American Cataloguing Rules.Revised ed. 2. 1998.

2. SEARS (ME). Sears List of Subject Headings.Latest edition.

**FE-LIS-CC-203A:      Management of Academic Library and Information System**

Maximum marks: 80
Pass marks: 32
Time: 3Hrs.

Note: The paper is divided into 4 units.  The question number 1 of the paper shall be compulsory; consisting of 8 very short answer type questions for 01 mark each; spread over all the units;to be answered in a word / one sentence / maximum 30 words.   The question numbers 2 to 5 shall be unit wise; long answer type questions for 8 marks each; to be answered within 800 words; required to attempt only 01 question from each unit, out of 02 questions.

**OBJECTIVES OF THE COURSE :**

・To understand basic functions of administration.
・To be familiar with housekeeping routines and work flow in libraries.
・To know about financial management in libraries.
・To be familiar with library statistics and records.

**COURSE OUTCOMES (CO):**
*   To introduce environmental factors of Academic Libraries and Information Centres.
*   To understand organisational structure.
*   To study functions and routines of different sections

Unit-I      **Fundamentals of Management**

Concept, Definition & Scope, Management Styles & Approaches. , Function and Principles of Scientific Management, Human Resource Management, Organizational Structure, Library Personnel. Job description and analysis, Job evaluation.

Total Quality Management (TQM)

Unit-II      **Budgeting, Library Statistics & Reporting**

Budgeting: Concepts, Definition, Purpose, & Functions.

Budgeting: Techniques & methods – Planning, Programming Budgeting System & Zero Based Budgeting. Methods of Financial Estimation

Annual Report –Compilation, Contents & Styles, Library Statistics.

Unit-III     **Academic Library House Keeping Operations**

Different Sections of Academic Library & Information centre and their functions.

Collection Development and Management Policies, Acquisition of Reading material & their Processing.

Serial Control, Circulation, Maintenance, Binding, etc. Stock verification- Policies and Procedures.

Unit-IV     **Planning  of building of Academic Library & Information Centres**

Concept, Definition, Need, Purpose, Types. Policies, Procedures & Steps in Planning.

Building and Space Management. Planning of related infra structure.

Library standards, Library Rules.

**RECOMMENDED BOOKS:**

Bryson Jo. (1996). Effective Library and Information Management. Bombay: Jaico Pub. House
Beardwell, Ian and Holden, Len (1996). Human Resource Management: A contemporary perspectives. London: Longman.
Chabhra, T N et. al. (2000). Management and Organisation. New Delhi: Vikas.
Drucker Peter F. (2002). Management Challenges for the 21st century. Oxford; Butterworth Heineman.
Kotler, Philip (2003). Marketing Management. 11th ed. New Delhi: Pearson.
Paton, Robert A. (2000). Change Management. New York: Response Books.
Rowley, Jennifer (2001). Information Marketing. Aldershot: Ashgate Publishing
Stoner, James A F (et.al). (1996). Management: Global Perspectives. 10th ed. New York: MC Graw Hill Inc.

**FE-LIS-CC-203B:**       **Management of Public Library and Information System**

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Maximum marks: 80
Pass marks: 32
Time: 3Hrs.
</div>

Note: The paper is divided into 4 units. The question number 1 of the paper shall be compulsory; consisting of 8 very short answer type questions for 1 mark each; spread over all the units; to be answered in a word / one sentence / maximum 30 words. The question numbers 2 to 5 shall be unit wise; long answer type questions for 8 marks each; to be answered within 800 words; required to attempt only 01 question from each unit, out of 02 questions.

**OBJECTIVES OF THE COURSE :**
• To understand basic functions of administration of Public Library and Information System.
 • To be familiar with housekeeping routines and work flow in libraries.
• To know about financial management in libraries.
• To be familiar with library statistics and records.

**COURSE OUTCOMES (CO):**
- To introduce environmental factors of Public Libraries and Information Centres.
- To understand organisational structure.

To study functions and routines of different sections

**Unit 1 : Growth and Role of Public Libraries**
History and Development of Public Libraries with Special Reference to India
Type and Functions of Public Libraries
Role of Public Libraries in Formal and Informal Education and Society
Public Libraries and National Development
Agencies and their Role in Promotion and Development of Public Libraries in India

**Unit 2 : Library Organization and Administration**
Library Organization and Administration
Administrative Organization of Library, Staff Manual, Library Surveys, Statistics, Work Measurement and Standards, etc.
Personnel Management in Public Libraries
Sources of Finance, Types of Budget, Methods of Financial Estimation, Budget Preparation

Planning, Basic Elements in the Design of Public Library Buildings
Library Furniture, Equipment.

**Unit 3 : Collection Development**
Principles of Collection Development
Selection Principles, Tools and Problems of Collection Development
Collection Development of Print Material (Books, Periodicals, Grey Literature, Patents, Standards, Govt. Publications, etc.)
Electronic Documents
Weeding out Policy

**Unit 4 : Resource Sharing and Information Networks**
Resource Sharing: Concept, Need and Purpose
Resource Sharing Networks in India
Resource Sharing Networks – RLIN, OCLC, etc.

**RECOMMENDED BOOKS:**

1. Bhatt, R. K. History and Development of Libraries in India. New Delhi: Mittal, 1995.
2. Ekbote, Gopala Rao. Public Libraries System. Hyderabad: Ekbote Brothers,1987.
3. Hage, Christine Lind. The Public Library Start-Up Guide. Chicago: American Library Association, 2004.
4. Jain, M. K.  Fifty years of library and information services in India (1947-98). Delhi: Shipra, 2000.
5. Kalia, D. R. Guidelines for Public Library Services and Systems. Kolkata: Raja Rammohan Roy Library Foundation,1990.
6. Rath, Pravakar. Public Library Finance. New Delhi: Ess Ess, 1996.
7. Thomas, V. K. Public Libraries in India: Development and Finance. New Delhi: Vikas, 2005.

**FE-LIS-CC-204A:** **Information Sources & Systems in Sciences**

Note: The paper is divided into 4 units. The question number 1 of the paper shall be compulsory; consisting of 8 very short answer type questions for 01 mark each; spread over all the units;to be answered in a word / one sentence / maximum 30 words. The question numbers 2 to 5 shall be unit wise; long answer type questions for 8 marks each; to be answered within 800 words; required to attempt only 01 question from each unit, out of 02 questions.

**OBJECTIVES OF THE COURSE :**

・To understand the different types of information sources.
・To develop familiarity with standard reference sources.
・To develop skills of critical evaluation of reference sources.

**COURSE OUTCOMES (CO):**
- To provide in-depth knowledge about information services and products.
- To familiarize students with various information services, information repackaging and consolidation.
- To introduce the nature and purpose of reference and other services.

**Unit-I** **Reference & Information Services.**

Reference Service- Concept, Definition, Types,

Reference Interview & Search Techniques .

Information Services- Concept, Definition, Need, Trends and Products.

Current Awareness Service (CAS) & Selective, Dissemination of Information (SDI)- Need Techniques.

**Unit-II** **Information Systems & Services**

National Information System: NISCAIR, DECIDOC, NASSDOC, SENDOC NISSAT- Their Functions, Services & Products.

International Information Systems: AGRIS, MEDLARS -Their Function, Services & Products.

**Unit-III** **Information Users, Their Need and User Education:**

Categories of Information Users. Information Needs: Definition, Models.

Information Seeking Patterns. User Studies: Method, technique & Evaluation.
Users Education, Goals & Objectives, Levels, Programmes, Techniques and Methods .

### Unit-IV     Reference and Information Sources

Documentary Sources of Information print and Non Print Nature, Characteristics, Utility and Evaluation of different types of Information Sources.

Non Documentary Information Sources Human & Institutional Sources –Nature, Types, Characteristics & Utility Categories –Primary, Secondary & Tertiary Information Sources. Internet as a Source of Information, CD-ROM databases.

### RECOMMENDED BOOKS:

1. Katz, W. A. (1969). *Introduction to Reference Work.* New York. Mc Graw Hills.
2. Sharma, J. S. & Grover, D.R (1987). *Reference Service & Sources of Information*. New Delhi: Ess Ess Publication.
3. Dhiman, Anil Kumar and Rani, Y. (2007). *Resource Sharing and Library & Information Networks.* New Delhi: Ess Ess Publication.

### FE-LIS-CC-204B       Information Sources &Systems in Social Sciences

Maximum marks: 80
Pass marks: 32
Time: 3Hrs.

Note: The paper is divided into 4 units.  The question number 1 of the paper shall be compulsory; consisting of 8 very short answer type questions for 01 mark each; spread over all the units;to be answered in a word / one sentence / maximum 30 words.   The question numbers 2 to 5 shall be unit wise; long answer type questions for 8 marks each; to be answered within 800 words; required to attempt only 01 question from each unit, out of 02 questions.

### OBJECTIVES OF THE COURSE :

· To understand the different types of information sources.
· To develop familiarity with standard reference sources.
· To develop skills of critical evaluation of reference sources.

### COURSE OUTCOMES (CO):
- To provide in-depth knowledge about information services and products.
- To familiarize students with various information services, information repackaging and consolidation.
- To introduce the nature and purpose of reference and other services.

### Unit 1 : Primary Sources
Social Sciences:  Definition, Terminology, Scope.
Primary Sources:  Periodicals, Government bulletins, Monographs, Memoirs.
Web based primary information sources.
Evaluation of representative sources in each category.

### Unit 2:Secondary and Tertiary Sources
Secondary Sources:  Dictionaries, Directories, Bibliographies, Treatises.
Tertiary Sources:  Guide to Literature, Bibliography of Bibliographies.
Web based secondary information sources.
Evaluation of representative sources in each category.

### Unit 3 : Information Systems & Networks
Information Systems and Networks in Social Sciences:  Need and Purpose.
Social Science Information Systems at National and International levels.

### Unit 4 : Academic Integrity and Plagiarism
Copyright Act, Intellectual Property Rights.

Plagiarism: Meaning, Kinds.
National and International Efforts for Anti-Plagiarism; Role of the UGC, India, Gazette Notifications.
Plagiarism Detection System: Online Software – URKUND.

**RECOMMENDED BOOKS:**

1. Katz, W. A. (1969). *Introduction to Reference Work.* New York. Mc Graw Hills.
2. Sharma, J. S. & Grover, D.R (1987). *Reference Service & Sources of Information.* New Delhi: Ess Ess Publication.
3. Dhiman, Anil Kumar and Rani, Y. (2007). *Resource Sharing and Library & Information Networks.* New Delhi: Ess Ess Publication.
4. https://www.urkund.com/

**FE-LIS-CC-205**       **Seminar**

Issues concerned with librarianship, information science / systems / services / networks, automation, networking, digitization, e-learning and relevant aspects.(Details at point 11.3 – initial pages)

# NEP and Learning Outcome-based Curriculum Framework (LOCF)

## For

### *M.Sc. in Environmental Studies*



## 2021-23

**Table of Contents**

# Background

Considering the curricular reforms as instrumental for desired learning outcomes, all academic Department of Maharaja Ganga Singh University made a rigorous attempt to revise the curriculum of postgraduate programmes in alignment with National Education Policy-2020 and UGC Quality Mandate for Higher Education Institutions-2021. The process of revising the curriculum could be prompted with the adoption of "Comprehensive Roadmap for Implementation of NEP". The Roadmap identified the key features of the Policy and elucidated the Action Plan with well-defined responsibilities and indicative timeline for major academic reforms.

The process of revamping the curriculum started with the series of webinars and discussions conducted by the University to orient the teachers about the key features of the Policy, enabling them to revise the curriculum in sync with the Policy. Proper orientation of the faculty about the vision and provisions of NEP-2020 made it easier for them to appreciate and incorporate the vital aspects of the Policy in the revised curriculum focusing on creating holistic, thoughtful, creative and well-rounded individuals equipped with the key 21st century skills 'for the development of an enlightened, socially conscious, knowledgeable, and skilled nation'.

With NEP-2020 in background, the revised curricula articulate the spirit of the Policy by emphasizing upon- integrated approach to learning; innovative pedagogies and assessment strategies; multidisciplinary and cross-disciplinary education; creative and critical thinking; ethical and Constitutional values through value-based courses; 21st century capabilities across the range of disciplines through life skills, entrepreneurial and professional skills; community and constructive public engagement; social, moral and environmental awareness; Organic Living and Global Citizenship Education (GCED); holistic, inquiry-based, discovery-based, discussion-based, and analysis-based learning; exposure to Indian knowledge system, cultural traditions and classical literature through relevant courses offering 'Knowledge of India'; fine blend of modern pedagogies with indigenous and traditional ways of learning; flexibility in course choices; student-centric participatory learning; imaginative and flexible curricular structures to enable creative combination of disciplines for study; offering multiple entry and exit points, alignment of Vocational courses with the International Standard Classification of Occupations maintained by the International Labour Organization; breaking the silos of disciplines; integration of extra-curricular and curricular aspects; exploring internships with local industry, businesses, artists and crafts persons; closer collaborations between industry and higher education institutions for technical, vocational and science programmes; and formative assessment tools to be aligned with the learning outcomes, capabilities, and dispositions as specified for each course. The University has also developed consensus on adoption of Blended Learning with 10% component of online teaching and 90% face to face classes for each programme.

The revised curricula of various programmes could be devised with concerted efforts of the Faculty, Heads of the Departments and Deans of Schools of Study. The draft prepared by each department was discussed in series of discussion sessions conducted at Department, Faculty and the University level. The leadership of the University has been a driving force behind the entire exercise of developing the uniform template and structure for the revised curriculum. The Vice Chancellor of the University conducted series of meetings with Heads and Deans to deliberate upon the vital parameters of the revised curriculum to formulate a uniform template featuring Background, Programme Outcomes, Programme Specific Outcomes, Postgraduate Attributes, Structure of Masters Course, Learning Outcome Index, Semester-wise

Courses and Credit Distribution, Course-level Learning Outcomes, Teaching-Learning Process, Blended Learning, Assessment and Evaluation, Keywords, References and Appendices. The experts of various Boards of Studies and Faculties contributed to a large extent in giving the final shape to the revised curriculum of each programme.

To ensure the implementation of curricular reforms envisioned in NEP-2020, the University has decided to implement various provisions in a phased manner. Therefore, the curriculum may be reviewed annually so as to gradually include all relevant provisions of NEP-2020.

## Programme Outcomes (PO)

The PG Courses of Faculty of Science will be able:

| PO | Description |
|---|---|
| PO1 | To acquaint students with recent knowledge and techniques in basic and applied sciences. |
| PO2 | To develop understanding of biological and environmental basis of life. |
| PO3 | To provide insight in to ethical implications of scientific research for environmental protection and good laboratory practices and bio safety. |
| PO4 | To develop problem solving innovative thinking with robust communication and writing skills in youth with reference to sciences. |
| PO5 | To understand application of biotic material in food security for human wellbeing and sustainable development. |
| PO6 | To impart practical and project based vocational training for preparing youth for a career in research and entrepreneurship in fields of sciences for self reliance. |

# Program Specific Outcomes (PSO)

| PSO | Description |
|---|---|
| **PSO-1** | To contribute to Environmental Sustainability and wise use of Natural Resources for benefit of society through education and research on environment with a multidisciplinary and professional approach |
| **PSO-2** | To provide knowledge on Ecology, Biodiversity Conservation, Remediation and Restoration. |
| **PSO-3** | To create awareness on Pollution, Climate Change, Ecotoxicology and their linkages to human health |
| **PSO-4** | To educate students on Environmental Impact Assessment, Monitoring and Policy frameworks |
| **PSO-5** | To give knowledge on concepts, tools and modern techniques for Environmental Analysis and Management |
| **PSO-6** | To educate students on Natural Resource Management and Sustainable Development. |

# Post Graduate Attributes

The graduate attributes of our students shall be aligned with those of our University in terms of touching "the life of every student through inculcating virtues of empathy, ethics, efficiency, respect for diversity, prudence and creativity with compassion". We wish to achieve this through rigorous teachings and research effort, which remains the basic tenet of our teaching-learning philosophy. The following are the University's graduate attributes which we emphasize.

- In depth Domain Knowledge
- Interdisciplinary Perspective
- Competence for Research and Innovation
- Analytical Competence
- Critical Thinking
- Problem Solving Competence
- Decision Making
- Information Technology Skills
- Ability to Work Independently
- Capacity for Creativity
- Contribute to Societal Well-being & Sustainability

# Structure of Programme

**Semester Ist: Four Core Compulsory, One Foundation Course, One Practical Course**

| | | |
|---|---|---|
| FS-ENV-CF-100 | Environmental Science Foundation Course (Audit) | Elementary concepts of Environment |
| FS-ENV-CC-101 | Environmental Science Core Compulsory | Environment and Ecology |
| FS-ENV-CC-102 | Environmental Science Core Compulsory | Environmental Geosciences |
| FS-ENV-CC-103 | Environmental Science Core Compulsory | Environmental Chemistry |
| FS-ENV-CC – 104 | Environmental Science Core Compulsory | Environmental Pollution |
| FS-ENV-CP – 105 | Practical | |

**Semester IInd: Four Core Compulsory, One Foundation Course, One Practical Course**

| | | |
|---|---|---|
| FS-ENV-CF-200 | Foundation Course (Audit) | National and Human Values |
| FS-ENV-CC-201 | Environmental Science Core Compulsory | Environmental Monitoring |
| FS-ENV-CC-202 | Environmental Science Core Compulsory | Desert Ecology |
| FS-ENV-CC-203 | Environmental Science Core Compulsory | Environmental Legislation |
| FS-ENV-CC–204 | Environmental Science Core Compulsory | Environmental Toxicology |
| FS-ENV-CP –205 | Practical | |

**emester IIIrd: Two Core Compulsory, One Core Elective, One Elective Open, One**

**Practical Course**

| | | |
|---|---|---|
| FS-ENV-CC-301 | Environmental Science Core Compulsory | Environmental Technology |
| FS-ENV-CC -302 | Environmental Science Core Compulsory | Environmental Impact Assessment-I |
| FS-ENV-CE -303 | Environmental Science Core Elective | FS-ENV-CE -303 (a) Population and Community Ecology **OR** FS-ENV-CE -303 (b) Biomes and Biogeography |
| FS-ENV-EO -304 | Environmental Science Elective Open | FS-ENV-EO -304 (a) Climate Science **OR** FS-ENV-EO -304 (b) Disaster Management |
| FS-ENV-CP -305 | Practical | |

**Semester IVth: Two Core Compulsory, One Core Elective, One Elective Open, One**

**Practical Course**

| | | |
|---|---|---|
| FS-ENV-CC-401 | Environmental Science Core Compulsory | Natural Resource Management |
| FS-ENV-CE-402 | Environmental Science Core Elective | FS-ENV-CE 402 (a) Environmental Impact Assessment-II **OR** FS-ENV-CE 402 (b) Biodiversity and Conservation |
| FS-ENV-EO-403 | Environmental Science Elective Open | FS-ENV-EO-403 (a) Environmental Issues, Awareness and Monitoring |

| | | **OR**<br>FS-ENV-EO-403 (b) Waste Management |
|---|---|---|
| FS-ENV-CC-404 | Environmental Science Core Compulsory | Dissertation |
| FS-ENV-CP-405 | Practical | |

# Learning outcome Index of the courses

### (i) Programme outcome (PO) and programme Specific Outcome(PSO)

|  | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 |
|---|---|---|---|---|---|---|
| PO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PO2 |  | ✓ |  |  |  |  |
| PO3 |  |  |  |  | ✓ |  |
| PO4 | ✓ | ✓ |  | ✓ |  | ✓ |
| PO5 |  |  | ✓ | ✓ |  | ✓ |
| PO6 |  | ✓ |  |  | ✓ |  |

### (ii) Programme Specific Outcome (PSO) and Core Courses

|  | ESCC 101 | ESCC 102 | ESCC 103 | ESCC 104 | ESCC 201 | ESCC 202 | ESCC 203 | ESCC 204 | ESCC 301 | ESCC 302 | ESCC 401 | ESCC 404 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PSO2 | ✓ | ✓ | ✓ |  |  | ✓ |  |  | ✓ |  | ✓ | ✓ |
| PSO3 |  | ✓ |  | ✓ |  |  |  | ✓ |  |  |  | ✓ |
| PSO4 |  |  |  |  | ✓ |  | ✓ |  |  | ✓ |  | ✓ |
| PSO5 |  |  | ✓ |  | ✓ |  |  |  |  | ✓ | ✓ | ✓ |
| PSO6 |  |  |  | ✓ | ✓ |  |  |  |  |  | ✓ | ✓ |

### (iii ) Programme Specific Outcome (PSO) and Elective Courses

|  | ESCE 303 A | ESCE 303 B | ESEO 304 A | ESEO 304 B | ESCE 402 A | ESCE 402 B | ESCO 403 A | ESEO 403 B |
|---|---|---|---|---|---|---|---|---|
| PSO1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PSO2 | ✓ | ✓ |  |  |  | ✓ |  | ✓ |
| PSO3 |  |  | ✓ |  |  |  | ✓ |  |
| PSO4 |  |  |  |  | ✓ |  |  |  |
| PSO5 |  |  |  | ✓ | ✓ | ✓ | ✓ | ✓ |
| PSO6 |  |  |  | ✓ |  |  |  | ✓ |

## Semester Wise Credit Distribution as per
## CHOICE BASED CREDIT SYSTEM (CBCS)

| Paper Code | Paper Name | Course | Lecture | Tutorial | Practical | Total Credits | Maximum Marks | | Minimum Passing Marks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Internal Marks | External Marks | |
| **Semester-I** | | | | | | | | | |
| **Theory Papers** | | | | | | | | | |
| *FS-ENV-CF-100 | Elementary Concept in Environment | Foundation Course | 2 | 2 | 1 | 5 | 50 | - | 18 (36%) |
| FS-ENV-CC-101 | Environment and Ecology | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-ENV-CC-102 | Environmental Geosciences | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-ENV-CC-103 | Environmental Chemistry | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-ENV-CC – 104 | Environmental Pollution | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| | | | | | | | 40 | 160 | |
| **\* Compulsory for all, Three attempts will be given** | | | | | | | | | |
| Total Theory Marks | | | | | | | 200 | | 72 (36% aggregate) |
| **Practical** | | | | | | | | | |
| FS-ENV-CP – 105 | Practical | Core Compulsory | | | | | 25 | 75 | 36 (36% aggregate) |
| | | | | Total Credits | | 25 | Grand Total | 300 | |
| **Semester-II** | | | | | | | | | |
| **Theory Papers** | | | | | | | | | |
| *FS-ENV-CF-200 | National and Human Values | Foundation Course | 2 | 2 | 1 | 5 | 50 | - | 18 (36%) |
| FS-ENV-CC-201 | Environmental Monitoring | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-ENV-CC-202 | Desert Ecology | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-ENV-CC-203 | Environmental Legislation | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-ENV-CC – 204 | Environmental Toxicology | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| | | | | | | | 40 | 160 | |
| **\* Compulsory for all, Three attempts will be given** | | | | | | | | | |
| Total Theory Marks | | | | | | | 200 | | 72 (36% aggregate) |
| **Practical** | | | | | | | | | |
| FS-ENV-CP – 205 | Practical | Core Compulsory | | | | | 25 | 75 | 36 (36% aggregate) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Total Credits | 25 | **Grand Total** | 300 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|

**Semester-III**

**Theory Papers**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| FS-ENV-CC-301 | Environmental Technology | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-ENV-CC -302 | Environmental Impact Assessment-I | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-ENV-CE -303 | (A) Population and Community Ecology **OR** (B) Biomes and Biogeography | Core Elective | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-ENV-EO -304 | (A) Climate Science **OR** (B) Disaster Management | Elective Open | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| | | | | | | | 40 | 160 | |
| | Total Theory Marks | | | | | | 200 | | 72 (36% aggregate) |

**Practical**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| FS-ENV-CP – 305 | Practical | Core Compulsory | | | | 25 | 75 | 36 (36% aggregate) |
| | | | | Total Credits | 20 | **Grand Total** | 300 | |

**Semester-IV**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| FS-ENV-CC-401 | Natural Resource Management | Core Compulsory | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-ENV-CE-402 | (A) Environmental Impact Assessment-II **OR** (B) Biodiversity and Conservation | Core Elective | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-ENV-EO-403 | (A) Environmental Issues, Awareness and Monitoring **OR** (B) Waste Management | Elective Open | 3 | 1 | 1 | 5 | 10 | 40 | 13 (25 %) |
| FS-ENV-CC-404 | Dissertation | Core Compulsory | 0 | 4 | 1 | 5 | - | 50 | 13 (25 %) |
| | | | | | | | 40 | 160 | |
| | Total Theory Marks | | | | | | 200 | | 72 (36% aggregate) |

**Practical**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| FS-ENV-CP – 405 | Practical | Core Compulsory | | | | 25 | 75 | 36 (36% aggregate) |
| | | | | Total Credits | 20 | **Grand Total** | 300 | |

FS-ENV-CF-100                          Elementary Concept in Environment
FS-ENV-CC-101                          Environmental Ecology
FS-ENV-CC-102                          Environmental Geoscience
FS-ENV-CC-103                          Environmental Chemistry
FS-ENV-CC – 104                        Environmental Pollution

FS-ENV-CP – 105                                    Practical

## Course Title: Elementary Concepts in Environment
## Course Code: FS-ENV-CF-100

**Course Objectives:** To disseminate knowledge to students about environment as a fundamental core issue in present time.
**Course Description:** Acquaintance with basic concept of earth environment with interdisciplinary approach.
**Course Outcome:** Sensitize the students towards environmental concerns issues and impact at local and global level.

### UNIT I
Introduction to the interdisciplinary nature of environmental science and fundamental issues in environmental science, including climate change, pollution, sustainability.
Overview of critical Earth systems and their interrelationships: Aquatic, terrestrial and atmospheric systems. Earth's structure, composition, surface features. Earth's processes.

### UNIT II
Four main motions of the Earth (rotation, revolution, precession and galactic rotation), Gaia theory of the Earth.
Earth's atmosphere and climate: Climate, Ice ages, Greenhouse effect, Global warming and climate change.

### UNIT III
Introduction to the Earth's physical systems: Weathering and soil formation.
Biosphere: Biodiversity and conservation of terrestrial systems.
Introduction to water resources and marine resources.

**Suggested Reading:**
  ➢ Cunningham, W.P., Cunningham, M.A. & Saigo, B. (2004) Environmental Science, a Global Concern. (8th edition). McGraw-Hill (Boston)
  ➢ Montgomery, C. (2005) Environmental Geology. McGraw-Hill.
  ➢ Nebel, BJ & Wright, R. (2004) Environmental Science: Toward a Sustainable Future. Prentice-Hall.
  ➢ Park, C. (2001) The Environment: Principles and Applications. Routledge
  ➢ Tyler Miller G. (2005) Living in the Environment: Principles, Connections, and Solutions. Belmont, Calif.: Brooks/Cole (14th International student edition)
  ➢ Wright, R.T. (2005) Environmental Science - toward a Sustainable Future. (9th International Edition), Pearson Education International, Prentice Hall Publishers.

### Course Title: Environment and Ecology

**Course Objectives:** To attain the fundamental knowledge of ecology and environment with conceptual framework in holistic manner.

**Course Description:** Basic attributes about principles of ecology, environment and their interrelationship with nature as an essential component.

**Course Outcome:**

**CO1:** Develop foundation on principles of Environmental Science and concept of structure and function of different compartments of the Environment.

**CO2:** Gain scientific perspective of the issues confronting our present day environment.

**CO3:** Enable to analyze the national and global environmental issues relating to atmosphere, water, soil and land use, biodiversity, and natural resources (global warming, climate change, mineral extraction and energy resources, environmental impact assessment and environmental audit).

## Unit I

Earth, man and environment. Environmental factors: Atmosphere, Hydrosphere, Lithosphere and Biosphere, and their interrelationships. Holistic concept, environmental complex, tolerances, ecological amplitude, limiting and inhibiting effects. Climatic factors: Pressure, temperature, RH, precipitation, radiation, wind. Edaphic factors: physical, chemical and biological characteristics.

## Unit II

Ecology- Definition, principles, and scope. Human ecology and settlement. ECOsystems: Structure and functions. Abiotic and Biotic components, Energy flows, Food chains, Food web, Ecological pyramids. ECOsystem types- Aquatic (freshwater, marine) and terrestrial (grassland, forest) eCOsystems. Concept of Population and Community. Ecotones and their importance.

## Unit III

Biogeochemical cycles and regulation, pools and fluxes, basic cycles: hydrologic, carbon, oxygen, nitrogen, phosphorus and sulphur cycles; Nutrient cycling in forest and aquatic eCOsystems.

**Suggested Readings:**

1. Basic ecology - E. P. Odum
2. Ecology and field biology - R.L. Smith
3. Ecology - P.D. Sharma
4. Fundamentals of ecology -E.P. Odum
5. Principles of ecology – Rickleff
6. Environmental Science – The natural environment and human impact (1998): A. R. W.
7. Jackson and J. M. Jackson, Longman
8. Environmental Science (2001) : S. C. Santra, New Central Book Agency (P) Ltd
9. Introduction to Environmental Science and Engineering (2nd Ed.) (2004): G. M. Masters, Pearson Education Pvt. Ltd.
10. Environmental Science (6th ed) (1997): Jr. G. T. Miller, Wadsworth Pub. Co.
11. Fundamentals of Environmental Science: G. S. Dhaliwal, G. S. Sangha and P. K. Raina,Kalyani Publication
12. General Climatology: Critichfield H. J.
13. Introduction to Weather and Climate : Trewartha

## Course Title: Environmental Geoscience
## Course Code: FS-ENV-CC-102

**Course Objectives:** To get acquaintance about domain knowledge in environmental geology with perspective of current environmental problems.

**Course Description:** It inculcates various ideas and concepts about earth interior environment as close system with various earth processes and geological process. It also emphasize on various natural hazards, calamities, occurs in nature with subject to their rationale management.

**Course Outcome:**

**CO1:** Lay foundation on basic geologic knowledge to maximize the utilization of all natural resources and minimize their degradation.

**CO2:** Empower with geological methods to minimize the destructive potential of natural processes and to sustain a healthy biosphere on earth.

**CO3:** Train on methods to identify common minerals & major rock types in hand specimens and under petrological microscope, and tools to analyze geomorphologic basis of land use and interpret plate tectonics and hazard zonation maps.

### Unit I

The earth systems and Biosphere: Conservation of matter in various geospheres-lithosphere, hydrosphere atmosphere and biosphere. Energy budget of the earth. Earth's thermal environment and seasons. General relationship between landscape, biomes and climate. Climates of India. Indian Monsoon. EI Nino. Droughts. Tropical cyclones and Western Disturbances.

### Unit II

Earth's Processes and Geological Hazards: Earth's processes; concept of residence, time and rates of natural cycle. Catastrophic geological hazards. Study of floods, landslides, earthquakes, volcanism and avalanche. Prediction and perception of the hazards and adjustments to hazardous activities, Plate tectonics.

### Unit III

Environmental Geochemistry: Concept of major, trace and REE. Classification of trace elements. Mobility of trace elements. Geochemical cycles. Biogeochemical factors in environmental health. Human use, trace elements and health. Possible effects of imbalance of some trace elements. Interface between climate and techniques geoindicators.

**Suggested Readings:**

1. Environmental geology- Edward A. Keller
2. Physical geology - C.W. Montgomery.
3. Geology of India - National book trust series.

## Course Title: Environmental Chemistry
## Course Code: FS-ENV-CC-103

**Course Objectives:** It elaborate that how the chemical reactions are responsible for governing the various nature cycles in the environment with respect to their positive and negative effects.

**Course Description:** It provides fundamental knowledge of chemical aspects in environment and various chemical reactions which are working as natural bulwark and also having concern with the anthropogenic activities held responsible for pollution in chemical manner.

**Course Outcome:**

**CO1:** Develop understanding on the chemistry of the lithosphere. Hydrosphere and atmosphere.

**CO2:** Gain understanding on the chemistry of various anthropogenic pollutants and basic analytical techniques.

**CO3:** Trains on chemical analysis of water and waste water, and the scientific principle of tools and techniques used for chemical analysis.

### Unit I

**Fundamentals of Environmental Chemistry**: Stoichiometry, Gibbs' energy, Chemical potential, chemical equilibria, acid base reactions, solubility product, solubility of gases in water, the carbonate system, unsaturated and saturated hydrocarbons, radionuclides.

### Unit II

**Chemical composition of Air:** Classification of elements, chemical speciation. Particles, ions and radicals in the atmosphere. Chemical processes for formation of inorganic and organic particulate matter. Thermochemical and photochemical reactions in the atmosphere. Oxygen and ozone chemistry, Chemistry of air pollutants, Photochemical smog.

### Unit III

**Water Chemistry:** Chemistry of water, concept of DO, BOD, COD, sedimentation, coagulation, filtration, Redox potential. **Soil Chemistry:** Inorganic and organic components of soil, Nitrogen pathways and NPK in soils.

**Suggested Readings:**

1. Environmental Chemistry - G.S. Sodhi
2. Environmental Chemistry - Mannahan
3. Fundamentals of soil science - Henry D. Futh
4. Textbook of limnology - G.A. Cole
5. Environmental Chemistry - Sharma and Kaur

### Course Title: Environmental Pollution
### Course Code: FS-ENV-CC-104

**Course Objectives:** To get familiarity about all kind of environmental pollutions and undesirable changes occur day to day in nature at local and global level.

**Course Description:** It describes various kinds of pollutions in consonance of their types, characteristics and their management strategies. It also contemplates short term and long term impact at various levels.

**Course Outcome:**

**CO1:** Examine the critical linkage between environmental pollution and human health.

**CO2:** Develop understanding on the mode of various diseases as triggered by the spread of contaminants in soil, water and air.

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**CO3:** Analyze different types of pollution and the guidelines for their control in the context of public health.
**CO4:** Enable to estimate physic-chemical properties of water and evaluate hydrologic parameters; catchment delineation and water balance.
**CO5:** Trains on basic analytical methods to quantify water quality, analyze hydrographs and determine hydrological parameters.

### Unit I

Overview of Environmental Pollution-Definition, types of pollutants, causes, effects, monitoring, prevention and control of pollution. Environment Pollution Local, Regional, Global aspect
**Air:** Natural and anthropogenic sources of pollution. Primary and Secondary pollutants. Transport and diffusion of pollutants. Gas laws governing the behaviour of pollutants in the atmosphere. Methods of monitoring and control of air pollution .$SO_2$, $NO_2$, CO, SPM. Effects of pollutants on human beings, plants, animals, materials and on climate. Acid Rain. Air Quality Standards. Global warming.

### Unit II

**Water:** Types, sources and consequences of water pollution. Physico-chemical and Bacteriological sampling and analysis of water quality. Sewage and waste water treatment and recycling. Water quality standards.
**Marine:** Sources of marine pollution and control. Criteria employed for disposal of pollutants in marine system, coastal management.
**Soil:** Physico-chemical and bacteriological sampling and analysis of soil quality. Industrial waste/effluents and heavy metals, their interactions with soil components. Soil microorganisms and their functions, degradation of different insecticides, fungicides and weedicides in soil. Different kinds of synthetic fertilizers (NPK) and their interactions with different components of soil. Soil Pollution Control.

### Unit III

Sources and generation of solid wastes, their characterization, chemical composition and classification. Different methods of disposal and management of solid wastes (Hospital Wastes and Hazardous Wastes)
Sources of noise pollution, measurement of noise and Indices, effect of meteorological parameters on noise propagation. Noise exposure levels and standards. Noise control and abatement measures. Impact of noise on human health. Radioactive waste and radioactivity from nuclear reactors; Thermal Pollution.
Impacts of large-scale exploitation of Solar, Wind, Hydro and Ocean energy.

**Course Outcomes (COs)**
**Suggested Readings:**
1. Air pollution and control - K.V.S.G. Murlikrishan
2. Industrial noise control - Bell & Bell
3. Environmental engineering -Peary
4. Introduction to environmental engineering and science - Gilbert Masters.

**Practical**
**Course Code: FS-ENV-CP-105**


**Study of Local Flora & Fauna:**
1.     Plant species diversity in a given area (one season data only)
2.     Species-wise population count of birds in a wetland/ terrestrial habitat.
3.     Qualitative and quantitative analysis of zooplankton, phytoplankton, periphyton and benthos.
4.     List of bioproducts used by a community living inside or in the proximity of a protected area.
5.     Study of Frequency, Abundance, density & IVI of give area.
6.     Study of vegetation by using quardrat & line fransect methods.
7.     Field study by using GPS & toposheet .
8.     Field visit to institution/ industrial units.
9.     Measurement of Noise level by using Noise level meter of residential, industrial & sensitive areas.
10.    Estimation DO, BOD & COD of given water sample.

**Monitoring of Water:** Turbidity, pH, Dissolved oxygen, Free carbon dioxide, Alkalinity, Salinity, Sodium, Potassium, Calcium, Magnesium, Carbonates, Bicarbonates, Chlorides, Sulphates, Nitrate, Phosphate, Silica.


**M.Sc. Second Semester**

| | |
|---|---|
| FS-ENV-CF-200 | National and Human Values |
| FS-ENV-CC-201 | Environmental Monitoring |
| FS-ENV-CC-202 | Desert Ecology |
| FS-ENV-CC-203 | Environmental Legislation |
| FS-ENV-CC–204 | Environmental Toxicology |
| FS-ENV-CP–205 | Practical |


**Course Title: National and Human Values**
**Course Code: FS-ENV-CC-200**

**Objectives:**

1.   To inculcate national and human values in the Students.
2.   To enable the students imbibe the Indian cultural ethos.
3.   To inculcate the spirit of Patriotism so that the Students develop a sense of strong bond with the nation.
4.   To enable the Students grow into a citizen possessing civic sense.

**Course Outcomes:**

On the completion of the course the students shall be able to

(i) Attain the civic skills enabling him/her to become a well-behaved citizen of the country.

(ii) Imbibe and spread the feelings of devotion and dedication.

## Course Description:

### Unit-I

1. NCC – Introduction, Aims, NCC Flag, NCC Song, NCC Administration, Raising of NCC in Schools/Colleges, NCC: Rank, Honours and Awards, NCC Training, NCC Camps, NCC Examinations, Incentive and Scholarship for Cadets.
2. Importance of Discipline in life, Aims and Merits of Discipline, Problems related to Indiscipline and Solutions.
3. Drill – Definition, Principles of Drill, Bad habits in drill, Words of Command, Drill Movements, Arms Drill, Squad Drill, Guard of Honour, Ceremonial Drill, Guard Mounting.
4. Contribution of NCC in Nation Building.

### Unit-II

1. Armed Forces – Control Command, Organization of Armed Forces, Weapons of Army, Navy and Air Force, Training institutes, Honours and Awards, Recipients of Param Veer Chakra, Badges of Ranks.
2. Commission in Armed Forces – Recruitment in Armed Forces, Commission in Technical, Non-Technical and Territorial Forces.
3. Weapon Training – 0.22 Rifle, 7.62 Rifle, 7.62 SLR (Self Loading Rifle), 5.56 MM I.N.S.A.S. Rifle, L.M.G. (Light Machine Gun), Stan Machine Carbine, 2" Mortar, Grenade, Pistol, Various types of Firing, Range Procedure and Range Drill.
4. Military History and Geography, Field Craft, Field Engineering, Battle Craft.

### Unit-III

1. Obstacle Training. Adventure Training, Self Defence, Physical Posture Training.
2. Social Service, Disaster Management, Health and Hygiene, First Aid.
3. Leadership, Personality Development, Decision Making, Motivation, Duty and Discipline, Morale.

### Unit-IV

1. Value system – The role of culture and civilization-Holistic living
2. Balancing the outer and inner – Body, Mind and Intellectual level- Duties and responsibilities
3. Salient values for life- Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity , and inclusiveness
4. Self-esteem and self confidence
5. punctuality – Time, task and resource management ,Team work
6. Positive and creative thinking.

1. Universal Declaration of Human Rights
2. Human Rights violations
3. National Integration – Peace and non-violence (in context of Gandhi, Vivekanad)
4. Social Values and Welfare of the citizen
5. The role of media in value building
6. Fundamental Duties
7. Environment and Ecological balance – interdependence of all beings – living and non-living.

## Assessment and Evaluation:

The Students shall be assessed and evaluated as per the schedule given below –
1. Project Report / Case Study (in 5000-7000 words handwritten) – 75%
2. Viva-voce  - 25%

The topics for the Project Report / Case Study shall be allotted by the Nodal Department (decided jointly with NSS wing under the supervision or IQAC) in consultation with the Department concerned. The Candidate shall submit the Report by the date fixed for the said purpose. It shall then be followed by a Viva-voce Examination. The whole evaluation shall be done by the Departmental Internal Faculty in consultation with the Nodal Department. It is a non-creditable Paper. The Student will have  to score simply a qualifying score/grade as specified in the CBCS rules.

The candidate will have to qualify the paper by the time He / She qualifies for the Programme. He/She can avail maximum 3 chances along with the Semester Examinations.

## Books Recommended:

1. Hand Book of NCC : Major R C Mishra & Sanjay Kumar Mishra

2. National Security: K. Subramanyam

3. ASEAN Security: Air Comdr. Jasjit Singh

4. Indian Political System, Dr . Pukhraj Jain & Dr. Kuldeep Fadiya

5. हैण्ड बुक ऑफ एनसीसी , मेजर आर. सी. मिश्र एवं संजय कुमार मिश्र

6. अन्तर्राष्ट्रीय राजनीतिः वी. एल. फाड़िया

7. भारतीय राजव्यवस्था , डॉ. पुखराज जैन , डॉ. कुलदीप फड़िया

8. राष्ट्रीय प्रतिरक्षाः डॉ. हरवीर शर्मा , जयप्रकाश नाथ कंपनी , मेरठ

9. राष्ट्रीय सुरक्षाः डॉ. लल्लन सिंह , प्रकाश बुक डिपो , बरेली

10. राष्ट्रीय सुरक्षाः डॉ. नरेन्द्र सिंह , प्रकाश बुक डिपो , बरेली

11. राष्ट्रीय सुरक्षाः डॉ. पाण्डेय व पाण्डेय , प्रकाश बुक डिपो , बरेली

12. राष्ट्रीय रक्षा व सुरक्षाः डॉ. एस. के. मिश्र , मार्डन पब्लिशर्स , जालंधर

13. NCERT, Education in Values, New Delhi, 1992.

14. M.G.Chitakra: Education and Human Values, A.P.H. Publishing Corporation, New Delhi,2003.

15. Chakravarthy, S.K.: Values and ethics for Organizations: Theory and Practice, Oxford University Press, New Delhi, 1999.

16. Satchidananda, M.K.: Ethics, Education, Indian Unity and Culture, Ajantha Publications,Delhi, 1991.

17. Das, M.S. & Gupta, V.K.: Social Values among Young adults: A changing Scenario, M.D.Publications, New Delhi, 1995.

18. Bandiste, D.D.: Humanist Values: A Source Book, B.R. Publishing Corporation, Delhi,1999.

19. Ruhela, S.P. : Human Values and education, Sterling Publications, New Delhi, 1986.

20. Kaul, G.N.: Values and Education in Independent Indian, Associated Publishers, Mumbai,1975.

21. Swami Budhananda (1983) How to Build Character A Primer : Ramakrishna Mission, NewDelhi.

22. A Cultural Heritage of India (4 Vols.), Bharatiya Vidya Bhavan, Bombay. (SelectedChapters only) For Life, For the future : Reserves and Remains –UNESCO Publication.

23. Values, A Vedanta Kesari Presentation, Sri Ramakrishna Math, Chennai, 1996.

24. Swami Vivekananda, Youth and Modern India, Ramakrishna Mission, Chennai.

25. Swami Vivekananda, Call to the Youth for Nation Building, Advaita Ashrama, Calcutta.

26. Awakening Indians to India, Chinmayananda Mission, 2003.

## Course Title: Environmental Monitoring
## Course Code: FS-ENV-CC-201

**Course Objectives:** It provides basic ideas, tools and techniques pertaining to analysis and monitoring of various environmental pollutions adopting methods and methodologies.

**Course Description:** The course envisages various principles, analytical methods in environmental monitoring as a part of surrounding environmental problems. It also gives the statically presentation of the outcome of monitoring using various models.

**Course Outcome:**

**CO1:** Equip with various methods used in the collection and analyses of data for Environmental Studies.

**CO2:** Train on the theory and practice of biostatistical tools for analyzing the data and deriving meaningful conclusions.

**CO3:** Investigate the potential of simulation models to understand the complexity of environmental processes and enables to use environmental modeling, remote sensing and GIS in environmental studies.

**CO4:** Develop the concept of systems and sub-systems, monitoring.

**CO5:** Learn to model various environmental systems, particularly those dealing with ecology and eCOsystems and study of environmental pollution in monitoring air and water quality.

**CO6:** Empower with major approaches towards natural resource issues and enables to think creatively about conflict and concord in general, with special emphasis on the roles of ideas and institutions in environmental politics.

**CO7:** Trains on the computational techniques and simulation models to analyze environmental processes.

## Unit I

Principles of Analytical Methods and their application in Environmental monitoring, with special reference to**:** Titrimetry, Gravimetry, Colourimetry, Spectrophotometry, Chromatography, Gas Chromatography, Atomic Absorption Spectrophotometry, GLC, HPLC, Electrophoresis, X-ray fluorescence, X-ray diffraction, Flame photometry.

## Unit II

Systems analysis for Environmental problems. Environmental monitoring for Air, Water, Soil, Radiation and Microbiology: Common parameters, sampling procedures and analytical techniques. Sampling methodologies for Environment matrices, Environment modeling.

## Unit III

Basic elements and tools of statistical analysis; Probability, sampling. Measurement and distribution of attributes; Distribution-Normal, t and x', Poisson and Binomial; Arithmetic, Geometric and Harmonic means; moments: matrices, simultaneous linear equations. Tests of hypothesis and significance.

Introduction to environmental system analysis; Approaches to development of models; linear simple and multiple regression models, validation and forecasting. Models of population growth and interactions-Lotka-Volterra model, Leslie's matrix model, point source stream pollution model, box model. Gaussian plume model.

**Suggested Readings:**
1. Principles of Biophysical chemistry - Uppadahay- and Nath.
2. Analytical Techniques - S.K. Sahani
3. Dynamics of Environmental Bioprocesses-Modelling and simulation-Snape and Dunn.
4. Environmental Modelling – Jorgensen

## Course Title: Desert Ecology
## Course Code: FS-ENV-CC-202

**Course Objectives:** As the university situated amidst in Thar Desert, the content of course emphasize on various aspects of Desert Ecosystem as a generic system.

**Course Description:** Course content derived various attributes in the study of arid climate with particular emphasis on resource management, adaptation, and desertification and conservation strategies.

**Course Outcome:**

**CO1:** Demonstrate emerging importance of the arid setting.

**CO2:** Explores the importance for policy, community mobilization, law and governance in desert areas.

**CO3:** Insight into some key challenges facing desert sustainability in the 21$^{st}$ century.

Definition and types of deserts. Major deserts of the world- Distribution and characteristics. Causes of desertification. Arid climate.

**Uint II**

Desert ecosystem with special reference to the Indian desert: environment, flora, fauna. Desert adaptations among plants and animals. Drought and famine, migration. Aridity index. Endangered plant and animal species of the Indian desert and their conservation strategies.

**Unit III**

Resource management in deserts- traditional and modern approaches. Saline tracts of the Rajasthan desert. Impact of canal irrigation on the ecology of the Indian desert. Approaches for combating desertification. Dry land farming. Waterbodies in arid and semiarid lands and their management strategies.

**Suggested Readings:**

Bothma, J. duP. Carnivore Ecology in Arid Lands. Springer-Verlag Berlin Heidelberg 1998.

Cloudsley-Thompson, J.L. 1984, Key Environments, Sahara Desert, Oxford Pregmon Press, London.

Epstein, E. 1972. Mineral Nutrition of Plants: Principles and Perspectives. Wiley Publishers, New York.

Goodall, D.W. and Perry, R. 1981. Arid Zone ECOsystems. Vol.I Cambridge University Press, Cambridge

Goodall, D.W. and Perry, R. 1981. Arid Zone ECOsystems. Vol.II Cambridge University Press, Cambridge.

Gupta, R.K. and Prakash, I. 1975. Environmental Analysis of the Thar Desert. English Book Depot, Dehradun.

Kalwar, S. C. Arid Ecology. Pointer Publishers.1999.

Levit, J. 1972. Response of Plants to Environmental Stresses. Academic Press. New York.

McGinnies, W. G. 1968. Deserts of the World – An appraisal of Research into their Physical and Biological Environment. University of Arizona Press, Tucson.

McGinnies, W.G., Goldman, B.J. and Paylore, (Eds.) 1968. Deserts of the World. University of Arizona Press. Tucson.

Prakash, I. 2001. Ecology of Desert Environments. Scientific Publishers, Jodhpur.

Sen, D.N. 1978. Concepts of Indian Ecology. S. Nagin & Co. Jullundur.

Sen, D.N. 1982. Environment and Plant Life in Indian Desert. Geobios International, Jodhpur.

**Course Title: Environmental Legislation**
**Course Code: FS-ENV-CC-203**

**Course Objectives:** To give the domain knowledge of various environmental laws and legislations governing within country and outside the country.

**Course Description:** The overall idea and necessity of various environmental laws, legislations, protocols, conventions, policy and rules are introduced with current scenario of the environment. It also focuses on the environmental friendly aspect of various environmental concerns and issues.

**Course Outcome:**

**CO1:** Develop insights into the role of environmental laws for planetary housekeeping, protecting the planet and its people from activities that upset the earth and its life sustaining capacities.
**CO2:** Enable to apply a range of regulatory instruments to preserve and protect the environment.
**CO3:** Demonstrate the strengths and weaknesses in law and its enforcement for developing strategies to overcome the same.

### Unit I
Overview of the ISO 14000 family, Key aspects of the International Standard ISO 14001. Environmental Management Systems: Benefits, Principles and elements of successful environmental management. Comparison between EMAS, BS77560 and ISO 14001. Auditing of EMS. Occupational Health and safety Management System (OHSMS), OHSAS 18001.

### Unit II
Provision in Constitution of India regarding Environment (Article 48A and 51G). Environmental (Protection) Act, 1986 and Rules 1986. Air (Prevention and Control of Pollution) Act, 1981 as amended by Amendment Act 1987 and Rule 1982. Water (Prevention and Control of Pollution) Act, 1974 as amended up to 1988 and Rules 1975. Wildlife (Protection) Act, 1972 amended 1991. Indian Forest Act (Revised) 1982. Biological Diversity Act, 2002.

### Unit III
Scheme of labelling of environmentally friendly products (Ecomark). Life Cycle Assessment. Ecological Footprinting. Public Liability Insurance Act, 1991 and Rules 1991. Bio-Medical Waste (Management and Handing) Rules- 1975; Hazardous Waste (Management and Handling) Rules- 1989. National Environmental Policy, NGT Act 2020.

**Suggested Readings:**
1. Environmental administration & law - Paras Diwaa.
2. Environmental planning, policies & programs in India - K.D. Saxena.

### Course Title: Environmental Toxicology
### Course Code: FS-ENV-CC-204

**Course Objectives:** The paper delegate toxic aspects of various environmental attributes and pampering for the impact and their solutions.
**Course Description:** It gives comprehensive ideas about various toxic chemicals in environment with respect to hazards particularly occupational and subjugated with assessment of their impact by using bio indicators and environmental quality determinant.
**Course Outcome:**
**CO1:** Lay foundation for in-depth understanding on the sources, origins and effects of various toxic materials and heavy metals that adversely affect environmental health.
**CO2:** Develop perspective on the movement of toxicants in different compo9nents of environment, in different levels of biological organization and in trophic transfer across the food chain.
**CO3:** Demonstrates the relationship between types of contaminants and effect on human health.

**CO 4:** Trains on the methods used to assess the ecotoxicological impact and human health issues due to increase in the levels of contaminants in environment.

### Unit I
Toxic Chemicals in the environment--Air, Water: Pesticides in water. Bio-chemical aspects of Arsenic, Cadmium, Lead, Mercury, Carbon monoxide, $O_3$ and PAN Pesticides, Insecticides, MIC, carcinogens in the air.

### Unit II
Occupational Health: Definition, Occupational Health Hazards, Common hazards: Pneumoconiosis. SiliCOsis, AnthraCOsis, Byssinosis, Bagassosis, Asbestosis, Farmers's Lung, Lead poisoning, Occupational Cancer, Occupational Dermatitis, and Radiation Hazards. Measures for health protection of workers and Role of WHO in Occupational Health. Occupational Health in India.

### Unit III
History and scope of toxicology. Toxicology of aquatic and terrestrial environments. Acute and chronic toxicity. Toxicity testing in field and enclosure. Toxic dose: Approximate acute LD50 /LC50 of some representative chemical agents. The use of biomarkers in assessing the impact of environmental contaminants. Bioassay. Trophic level transfer of contaminants. Bioindicators of environmental quality.

**Suggested Readings:**
1. Principles of Environmental Toxicology: I. C. Shaw and J. Chadwick; Taylor& Francis ltd
2. Basic Environmental Health (2001): Annalee Yassi, Tord Kjellstr"om, Theo de Kok, Tee Guidotti
3. Environmental Health: Monroe T. Morgan
4. Handbook of Environmental Health and Safety – principle and practices: H. Koren; Lewis
Publishers
5. C.Lu.Frank and Kacew.Sam (2002). Lu.s Basic toxicology: Fundamentals, target organs and
risk assessment;4th edition.Taylor and Francis, London.
6. Tambrell, J. (2002). Introduction to Toxicology. Taylor and Francis, London.
7. Rana, S.V.S. (2011). Environmental Pollution: Health and Toxicology. Narosa PublishingHouse, New Delhi.

### Practical
### FS-ENV-CC-205

**Monitoring of Soil**: Measurement of Bulk density, Specific gravity, Moisture content, Conductivity, pH, Alkalinity, Soluble ions, Nitrogen, Phosphorus, Sulphur.
**Geographical data:**
1. Meteorological records – Pressure, Temperature, Precipitation, Humidity, wind.
2. Drainage basin and network morphometry
3. Slope and aspect maps, Critical slope for specified activities, Profiles.
4. Climatic maps and diagrams: circular graph, climograph, water budget, wind roses (simple and compound)
5. Application of GPS in various environmental applications.
6. Estimation of Biodiversity by using various diversity indices.
**Visit:**

Visit to a terrestrial or aquatic location of ecological importance.

## M.Sc. Third Semester

| | |
|---|---|
| FS-ENV-CC-301 | Environmental Technology |
| FS-ENV-CC -302 | Environmental Impact Assessment-I |
| | FS-ENV-CE -303 (a) Population and Community |
| FS-ENV-CE -303 | OR |
| | FS-ENV-CE -303 (b) Biomes and Biogeography |
| | FS-ENV-EO -304 (a) Climate Change |
| | OR |
| FS-ENV-EO -304 | FS-ENV-EO -304 (b) Disaster Management |
| | |
| FS-ENV-CP -305 | Practical |

==Course Title: Environmental Technology==
==Course Code: FS-ENV-CC-301==

**Course Objectives:** To get acquaintance with monitoring aspects of all environmental attributes using environmental technology for qualitative and quantitative assessment.

**Course Description:** It describe the monitoring aspects of Air water, soil by using modern tool techniques for safeguard of environment.

**Course Outcome:**

**CO1:** Develop evolutionary perspective on the relationship between and evolution of technology and environment.

**CO2:** Develop in-depth understanding on the role and contribution of different types of economic and social mechanism in the contemporary societies shaping the structure and function environment.

**CO3:** Demonstrate the technological changes in the direction of sustainable development, which will help to achieve ecological and social justice.

### Unit I

Scope, Purpose and Objectives of Air Quality Monitoring Programme; Guidelines and Design of an air quality surveillance network; Period, frequency and duration of sampling; Principles and instruments for sampling and measurement of -(i) ambient air pollutants, and (ii) stack emissions (monitoring).

Dispersion of Pollutants: maximum mixing depth, lapse rate, stability conciliations, plume behaviour, calculation of effective stack height.

### Unit II

General methods of control of Gaseous pollutants-scrubbers, condensers, control equipment for particulate matter-gravity settling chambers, cyclone, fabric filters, electrostatic precipitators, case study of thermal power plants. Control of Mobile Source Emissions. Automobile Exhausts.

### Unit III

Water Pollution Control: Drinking Water Treatment Procedures, Flocculation, Settling, Filtration, reverse sand filter, cleaning, chlorination.

Methods of Cleaning Potable Water: Filtration, Electro-dialysis, principle & theory of chemical oxidation. Disinfection mechanism: Ozone, permanganate, chlorination. Reverse osmosis. Ultra filtration. Water quality standards.

Environmental Biotechnology: Fermentation, Vermiculture, Biogas, Biofertilizer, Bioremediation technologies.

**Suggested Readings:**
1. Air Pollution – Stern
2. Environmental Pollution Control Engineering: C. S. Rao
3. Environmental Chemistry: B.K. Sharma, and H. Kaur
4. Air pollution – threat and response: D. A. Lynn
5. Air pollution and Environmental Protection – Legislative policies, Judicial trend and Social
perceptions: N. Kumar; Mittal Publication

## Course Title: Environmental Impact Assessment-I
## Course Code: FS-ENV-CC-302

**Course Objectives:** To build understanding and application aspects of environmental impact assessment as a tool.

**Course Description:** It gives analytical aspects of environmental impact due to various developmental activities using environmental appraisal, environmental auditing, planning with help of various methodologies to achieve sustainable development.

**Course Outcome:**

**CO1:** Lay foundation on the concept and components of environmental impact assessment.

**CO2:** Enable to practice EIA that examines the environmental consequences of development actions, in advance.

**CO3:** Investigate the agenda of all environmental agencies as a result of introduction of legislations in various countries.

**CO 4:** Develop skill to evaluate the issues and problems in environmental assessment from the perspective of process and methods, and goals of EIA.

### Unit I

Introduction to environmental impact analysis. Environmental impact Statement and Environmental Management Plan. EIA guidelines 2006, Notifications of Government of India. Impact Assessment Methodologies, their strengths and weaknesses. Generalized approach to impact analysis. Procedure for reviewing Environmental impact analysis and statement.

### Unit II

Guidelines and basic principles of Environmental auditing -Definition, functions, benefits and Costs of Environmental Auditing. Introduction to Environmental planning. Base line information and predictions (land, water, atmosphere, energy, etc.). Landuse policy for India. Urban planning for India. Rural planning and landuse pattern. Concept and strategies of sustainable development. Cost-Benefit analysis. Environmental Appraisal Accounting, Green Balance Sheet-SJA.

### Unit III

Environmental Appraisal with particular reference to:
1. Mining Projects

2. Industrial Projects

3. Thermal Power Projects

4. River Valley, Multipurpose, Irrigation and H.E. Projects

5. Infrastructure Development and Miscellaneous Projects

6. Nuclear Power Projects

**Course Outcomes (COs)**
**Suggested Readings:**
1. Environmental Impact Assessment- John Glasson.
2. Methods of Environmental Impact Assessment - Morris and the rivel.
3. Environmental Imapct Assessment - L. W. Canter.
4. Chemical principles of Environmental pollution - Lalloway and Ayers.
5. Industrial Environment - Assessment and strategy - S.K. Aggarwal
6. Kulkarni, V.S., Kaul, S.N. and Trivedi, R.K. (2002). A Handbook of Environmental
Impact Assessment. Scientific Publishers, India.

**Course Title: Population and Community Ecology**
**Course Code: FS-ENV-CE -303 (a)**
**Course Objectives:** It strives on dynamic aspects and approaches of population and community ecology.
**Course Description:** An approach has been made to conceptualize population dynamics, community dynamics and various ecological processes or life support system for the restoration of ecology with idea of stability and fragility.
**Course Outcome:**
**CO1:** Lay Explain Intraspecific and Interspecific interactions.
**CO2:** Explain the application of stage and age structured population dynamics.
**CO3:** Apply the riche concept and evaluate the importance of species composition and diversity for population and community dynamics.
**CO4:** Explain the importance of spatial scale for interactions within and between populations.
**CO5:** Assess the importance of interactions in food webs for the development of populations and communities.
**CO6:** Develop a comprehensive historical perspective on the interactions between human societies in relationship to eCOsystems in ancient to modern societies.
**CO7:** Gain knowledge on the present day environmental dilemmas, and the conflicts and choices that have their roots in the past.
**CO8:** Examine the ways in which environmental changes, often the result of humans actions, have caused historical trends in human societies.

**Unit I**
Concepts and Scope Environmental Biology. Impact of environment at cellular level. Eco-physiological adaptations in plants and animals for stressed environments. Biosphere as an eCOsystem, its ecological processes and life support systems. Anthropogenic impact on the biosphere and its life support systems (including flora, fauna, soil, climate, atmosphere, terrestrial and aquatic eCOsystems). Role of biological processes in remedial measures and restoration.

**Unit II**

**Population Ecology**: Factors determining population.     Factors leading to the commonness, rarity and vulnerability of extinction of a species.     Population Dynamics: Patterns of survival, age distribution, dispersal and rates of change. Attributes of K-selected and r-selected species. Population Growth. Common approaches in population density measurement.

## Unit III

**Community Ecology**: Concept and types of communities. Interspecific and intraspecific interactions. Concepts of niche and keystone species. Role of nutrients, water and energy in determining community. Succession, development, climax and stability of eCOsystems.

**Suggested Readings:**

Brown, J.H. and Lomolino, M.V (1998). Biogeography. Sinauer Associates Inc., Sunderland,Massachusetts.

2. Cox, C. B. and Moore, P.D. (2000). Biogeography – An Ecological and Evolutionary Approach. Blackwell Scientific Ltd. pp. 298. London.

3. Fahrig, L., and K. Freemark. (1994). Landscape-scale effects of toxic events for ecological risk assessment. In J. Cairns and B.R. Niederlehner (eds.), Ecological Toxicity Testing, Scale, Complexity, and Relevance. Lewis Publishers, Boca Raton, FL.

4. Weinstein, D.A., and H.H. Shugart. (1983). Ecological modeling of landscape dynamics. In H.A. Mooney and M. Godron (eds.), Disturbance and ECOsystems. Springer-Verlag, NewYork.

**Course Title: Biomes and Biogeography**
**Course Code: FS-ENV-CE -303 (b)**

**Course Objectives:** To determine the importance of biomes as an extensive ecosystem within country and outside.

**Course Description:** The emphasize given on terrestrial, aquatic biomes with their climatic classification challenges, human influences, composition, characteristics and extend in India and other region of the world.

**Course Outcome:**

**CO1:** Explain Biome concept.

**CO2:** Explain Biogiography.

**CO3:** Developing link between eCOsystem functionality & Biogeography.

**CO 4:** Understanding on drivers of vegetation patterns at large spatial scales based on biodeographical zones.

## Unit I

**Biomes**:

Climatic and edaphic factors of terrestrial biomes. Heinrich Walter's Biome Climate Diagrams.

Classification of land biomes with their soil, climate and vegetation characteristics. Their natural history, wildlife, geography and human influences.

Mountain Biome: Replication of latitudinal changes in the altitudes of high mountains.

Terrestrial biomes, eCOsystem diversity, forest and vegetation types in India.

## Unit II

Freshwater and Marine biomes:

Challenges and adaptations of life in aquatic biomes (freshwater: lentic and lotic; marine).

Freshwater Biomes (Rivers, streams, lakes, ponds) and their natural history.

Marine Biomes (including mangroves, coral islands, kelp forests, saltwater marshes, seashores, estuaries) and their natural history.

Estuaries, their characteristics and biota.

Wetlands- definitions, types, ecological functions and resources.

## Unit III

**Biogeography: India & World:**

Major biogeographic (zoogeographic and phytogeographic) regions of the world and India, extent, characteristics and species composition.

Continental Drift: Its causes and consequences for distribution of life on earth.

India's biogeographical history, current geographical position and their impact on biodiversity.

India's forests and vegetation types. Protected Area Network.

**Suggested Readings:**

Brown, J.H. and Lomolino, M.V (1998). Biogeography. Sinauer Associates Inc., Sunderland,Massachusetts.

2. Cox, C. B. and Moore, P.D. (2000). Biogeography – An Ecological and Evolutionary Approach. Blackwell Scientific Ltd. pp. 298. London.

3. Fahrig, L., and K. Freemark. (1994). Landscape-scale effects of toxic events for ecological risk assessment. In J. Cairns and B.R. Niederlehner (eds.), Ecological Toxicity Testing, Scale, Complexity, and Relevance. Lewis Publishers, Boca Raton, FL.

4. Weinstein, D.A., and H.H. Shugart. (1983). Ecological modeling of landscape dynamics. In H.A. Mooney and M. Godron (eds.), Disturbance and ECOsystems. Springer-Verlag, NewYork.

## Course Title: Climate Science
## Course Code: FS-ENV-EO -304 (a)

**Course Objectives:** To conceptualize the idea of climate or climate change at the pace of different time scale.

**Course Description:** Narration about the concept of climate change with respect to monitoring, anthropogenic drivers and policy framework. It also emphasize on various models of climate and resilience about climate.

**Course Outcome:**

**CO1:** Understand & explain the physical basis of the natural greenhouse effect and global climate change.

**CO2:** Explain the role of greenhouse gases in Earth's energy budget & climate system.

**CO3:** Describe the strengths & weakness of existing climate related policies.

**CO4:** Understand climate change mitigation & adaption practices.

## Unit I

Introduction to Climate Change Science: Climate, Weather, Earth's Climate System. Greenhouse Effect. Greenhouse gases and their main sources. Monitoring of Climate, Climate archives, climate data and models. Climate change on different timescales over the past.

## Unit II

Modern Climate change since industrial revolution: Anthropogenic Drivers of Climate Change. Observed Trends and Projected Trends of Climate change. Role of aerosols, black carbon and hydrocarbons in climate change. Impacts of Climate

Change: food security, energy security, water security, human health and diseases, climate resilient agriculture, climate refugees.

## Unit III

The Climate Change Policy Framework: Provisions of the United Nations Framework Convention on Climate Change (UNFCCC). The Kyoto Protocol. Climate Change Adaptation. National Action Plan on Climate Change, Climate Change Mitigation and Low Carbon Development: Strategic Frameworks and Policy Approaches. Climate Change Finance. Carbon sequestration and carbon credits.

**Suggested Readings:**

Brohe, Arnaud, Nick Eyre, and Nicholas Howarth. 2009. Carbon Markets: An International Business Guide (Environmental Market Insights). Routledge.

Labatt, Sonia, and Robert R. White. 2007. Carbon Finance: The Financial Implications of Climate Change (Wiley Finance). Wiley Finance.

Esty, Daniel C., and Andrew Winston. 2009. Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value, and Build Competitive Advantage. Wiley.

Botkin, Daniel B. and Keller, Edward A. Environmental Science: Earth as a Living Planet. 6th ed. John Wiley & Sons, USA. 2007.

Burroughs, W.J. Climate Change: A Multidisciplinary Approach. 2nd ed. Cambridge University Press. 2007.

Chasek, P. S. The Global Environment in the Twenty-First Century - Prospects for International Co-operation. Indian Reprint by Manas Publications, New Delhi. 2004.

Claussen, E. ed. Climate Change: Scenario, Strategies and Solutions. Arlington VA. 2001.

Dash, S. K. Climate Change-An Indian Perspective. Centre for Environment Education and Cambridge University Press Pvt. Ltd., New Delhi. 2007.

Dodds, F. (ed.). Earth Summit. 2002. A New Deal. Earthscan Publications Ltd., UK. 2002.

Enger, E.D. and Smith, B. F. Environmental Science: A Study of Interrelationships. 11th ed. McGraw Hill Inc., USA. 2006.

Hardy, John T. Climate Change: Causes, Effects, Solutions. Wiley & Sons, USA. 2003.

Harris, F. Global Environmental Issues. Wiley & Sons, Inc., USA. 2004.

Harvey L. D. D. Global Warming: The Hard Science. NY: Prentice-Hall.2000.

Singh, J.S., Singh, S.P. and Gupta, S.R. Ecology, Environment and Resource Conservation. Anamaya Publishers, New Delhi, India. 2006.

Speth, J. C. Global Environmental Challenges – Transitions to a Sustainable World. Orient Longman Pvt. Ltd., New Delhi. 2004.

UNEP. Global Environmental Outlook 3: Past, Present and Future. Earthscan Publications. 2002.

**Course Title: Disaster Management**
**Course Code: FS-ENV-EO -304 (b)**

**Course Objectives:** Gives insight into various environmental hazards, risks and disaster in India and world scenario.

**Course Description:** Provides domain knowledge of natural hazards, vulnerability, and disasters with using reduction strategies, early warning system and management strategies in light of disaster management act, 2005.

**Course Outcome:**

**CO1:** Gain insights into various environmental hazards, their causes, nature preparedness and assessment of loss.

**CO2:** Empower to develop model hazards and learn methods of disaster management.

**CO3:** Trains on preparation of hazard zonation map of India for landslides, earthquakes, floods; methods to estimate earthquake-loss using remote sensing and GIS, and prepare master plan for any environmental hazard mitigation.

## Unit I

Concepts of Hazard, Vulnerability, Risks, Natural Disasters (earthquake, Cyclone, Floods, Volcanoes), and Man Made Disaster ( Armed conflicts and civil strip, Technological disasters, Human Settlement, Slow Disasters (famine, drought, epidemics) and Rapid Onset Disasters (Air Crash, tidal waves, Tsunami) Risks, Difference between Accidents and Disasters, Simple and Complex Disasters.

## Unit II

Disaster Cycle, Phases of Disaster. Disaster Risk Reduction Strategies, Early warning Systems.

Components of Disaster Relief-(Water, food, sanitation, shelter, Health and Waste Management). Principles of Disaster Epidemiology, Environment health hygiene and sanitation issues during disasters. United Nation International Strategy for Disaster Risk Reduction (UNISDR).

## Unit III

India's Hazard and Vulnerability Profile, Disaster Management Indian scenario. Disaster Management Act 2005 and Policy guidelines. Cases Studies: Bhopal Gas Disaster, Gujarat Earth Quake, Orissa Super-cyclone, south India Tsunami, Bihar floods. Best practices in disaster management, Case Studies of drought in Rajasthan, India and World.

**Suggested Readings:**

Disaster Reduction: Living in harmony with nature Kurowa, Julio

Human Development Report 2005: Internation co-operation at a cross roads: Aid, trade and security in an unequal world Watkins, K

Know risk Jeggle, Terry

World disaster report: Focus on information in disasters Jonathan, Walter

Advances in natural technological hazards research: International perspectives on natural disasters Occurrences, mitigation and consequences De Chano LM, Lidstone J & Stoltman Joseph M

**Practical**
**Course Code: FS-ENV-CP -305**

**Geo-informatics:**
1. Introduction of the GIS software.
2. Geo-referencing
3. Base layer preparation / Digitization
4. Preparation of Geo-database.
5. Mosaicing.
6. Classification of Satellite Image.

**Solid Waste Analysis**
1. Physical composition (by weight)

2. Moisture content
4. pH and Conductivity

**Environmental Statistics**
1. Grouping of data and preparation of frequency distribution. Histogram and frequency polygon.
2. Calculating mean, median and mode for grouped and ungrouped data.
3. Calculating variance, standard deviation and coefficient of variation for grouped and ungrouped data.
4. Fitting simple linear regression. Plotting scatter diagram and regression line.
5. Computing correlation coefficient and testing its significance for grouped and ungrouped data.
6. Comparison between means of two independent samples. Paired t-test.
7. Analysis of variance one way classification.
8. Analysis of variance: two-way classification.

## M.Sc. Fourth Semester

| | |
|---|---|
| FS-ENV-CC-401 | Natural Resources and Management |
| FS-ENV-CE-402 | FS-ENV-CE-402 (a) Environmental Impact Assessment-II OR FS-ENV-CE-402 (b) Biodiversity and Conservation |
| FS-ENV-EO-403 | FS-ENV-EO-403 (a) Environmental Issues, Awareness and Monitoring OR FS-ENV-EO-403 (b) Waste Management |
| FS-ENV-CC-404 | Dissertation |
| FS-ENV-CP-405 | Practical |

## Course Title: Natural Resources and Management
## Course Code: FS-ENV-CC-401

**Course Objectives:** Develop thinking about use of remote sensing in various environmental applications.

**Course Description:** It contemplates various aspects of remote sensing in environmental planning and also deliver about various energy use scenario in India concerned with the harness and feasibility

**Course Outcome:**

**CO1:** Demonstrate the human dimension of development and environment.

**CO2:** Gain insight on management of natural resources.

**CO3:** Train in tools and methodologies of ecological and environmental economics.

**CO4:** Empower with the integrated use of economics & ecology in decision making & law making process.

**CO5:** Acquire ideas and tools developed in other branches of economics to make significant contribution to valuation techniques, design of policy instruments for pollution control and management of commons.

**CO6:** Enables to use the COst-benefit analysis and instruments for pollution control and management of commons.

**CO7:** Analyze contemporary conflicts, struggles and policy choices around natural resources.

**CO8:** Develop critical thinking on who controls the environment and how, and who degrades nature and why.

**CO9:** Develop perspective on major approaches towards natural resource issues and enable to think creatively about conflict and concord in general, with special emphasis on the roles of ideas and institutions in environmental politics.

**CO10:** Learn skills to analyze case studies on big dams and endangered fauna, industrial pollution and global warming, the role of gender and empire.

## Unit I

Principles of Remote sensing and their application in Environmental Sciences. Application of GIS in Environmental Management. Landuse Planning: The landuse plan. Soil surveys in relation to landuse planning. Methods of site selection and evaluation.

## Unit II

Sun as source of energy, solar radiation and its spectral characteristics. Fossil fuels-classification, composition, physico-chemical characteristics and energy content of coal, petroleum and natural gas. Principles of generation of hydroelectric power, tidal, Ocean Thermal Energy Conversion, wind, geothermal energy; solar collectors, photovoltaic, solar ponds; nuclear energy- fission and fusion; magnetohydrodynamic power, bio-energy-energy from biomass and biogas, anaerobic digestion; energy use pattern in different parts of the world.

## Unit III

Water Resources and Environment: Global Water Balance. Ice sheets and fluctuations of sea levels. Types of water. Origin and composition of seawater. Hydrological cycle. Factors influencing the surface water. Resources of oceans.

Mineral Resources and Environment: Resources and Reserves. Minerals and Population. Oceans as new areas for exploration of mineral resources. Environmental impact of exploitation, processing and smelting of minerals.

**Suggested Readings:**
Living in the environmental - T.J. Miller.
Natural resource conservation - Owen & Chiras.
Encyclopaedia Energy - I & II.
Natural resources conservation -Oliver Ss. Owen.
Ecology of Natural resources – Ramade
Environmental Science- Cunningham Saigo
Restoration of degraded lands- J.S. Singh
Introduction to Environmental remote sensing – Curtis
Principles of Remote sensing - Lily and Kliffer.
Remote sensing of the Environment – Jenson

## Course Title: Environmental Impact Assessment-II
### Course Code: FS-ENV-CE-402 (a)

**Course Objectives:** Develop professional understanding of EIA formulation.

**Course Description:** Contents gives idea about how to develop or prepare comprehensive EIA/SEIA report as a part of decision making and also address about procedure, process and implementation of EIA.

**Course Outcome:**

**CO1:** Lay foundation on the concept and components of environmental impact assessment.

**CO2:** Enable to practice EIA that examines the environmental consequences of development actions, in advance.

**CO3:** Investigate the agenda of all environmental agencies as a result of introduction of legislations in various countries.

**CO 4:** Develop skill to evaluate the issues and problems in environmental assessment from the perspective of process and methods, and goals of EIA.

## Unit I

Reporting: - Features & purpose of EIA Reports, Main elements of EIA Report, Shortcoming encountered in preparing EIA reports. Review of EIA Quality:- Role & purpose of the Review process, Aspects for consideration, EIA Review- Types of Procedures, Steps involved in EIA Review, EIA review criteria, EIA review methods, Four steps approaches for EIA review. Environmental Management plan Or Impact management Plan.

## Unit II

Decision Making: - concepts and its importance, responsibilities f decision makers in EIA process, Decision Making Process. Implementation & Follow up:- Need & purpose, Its components, Guiding Principles and elements, Aspects and Issues needs to be considered in EIA implementation & follow up.

## Unit III

EIA Project Management: - its concepts, Role of Project Manager, Characteristics & Attributes of an interdisciplinary of EIA team, Project Managers Responsibilities. Social Impact Assessment:- concept, role & purpose of SIA, Benefits of SIA, Steps & principles of SIA, Methods used for predicting Social Impacts.

**Suggested Readings:**

Canter, Larry W. Environment Impact Assessment. McGraw-Hill.

Rau, G.J. and C.D. Weeten. 1980. Environmental Impact Analysis Handbook. McGraw Hill.

Glasson, John, Rikki Therievel and Andrew Chadwic. 1996. Introduction to Environmental Impact Assessment, 2nd edition UCL Press.

Kulkarni, Vijay and T.V. Ramchandra. Date Environmental Management. Capital Publishing.

Mhaskar, A.K. Environmental Audits.Enviro Media Publications. Eccleston, Charles H. 2011. Environmental Impact Assessment: A Guide to Best Professional Practices. CRC Press.

Morris, Peter and RikiTherivel. 2009. Methods of Environmental Impact Assessment (Natural and Built Environment Series). Routledge.

## Course Title: Biodiversity and Conservation
### Course Code: FS-ENV-CE-402 (b)

**Course Objectives:** To address about critical aspects of biodiversity as cradle for civilization.

**Course Description:** Overall idea has been given about biodiversity with respect to their classification, importance, threats and conservation strategies.

**Course Outcome:**

**CO1:** Demonstration importance of diversity at different levels of biological organization.

**CO2:** Lay foundation on basis concept of ecological and biological processes that ensures long-term stability of ecosystems.

**CO3:** Train on the methods for measurement of species diversity and molecular diversity.

**CO 4:** Analyze the values of biodiversity and scientific approaches for conservation that can lead to sustainable development.

## Unit I

Definition, classification and importance of Biodiversity; Causes of biodiversity reduction and strategies for biodiversity conservation. Endangered and Threatened Species (Flora and fauna) of India and Rajasthan, Hotspots of Biodiversity. Strategies of biodiversity conservation in India and the world (in situ and ex situ).

1. Magnitude and distribution of Biodiversity (global and Indian) and its characterization.
2. Rapid assessment of biodiversity and its valuation, skill, trained personnel and resources needed for the task.
3. Evaluating nature, scale and intensity of the threats to biodiversity.

## Unit II

1. Role of plants in natural eCOsystems and life support system (terrestrial, freshwater and marine)
2. Importance of traditional cultivars and wild species in agriculture.
3. Role of plants in modern and traditional medicine.
4. Value of plants in scientific research and technological inventions.
5. Value of microbes in medicinal, scientific and technological research solutions and inventions.
6. Vegetation zones of India and Rajasthan.

## Unit III

1. Role of animals in conservation of natural eCOsystems.
2. Role of wild and domesticated fauna in human nutrition.
3. Importance of animal species (terrestrial and marine) in medicine.
4. Important wild animals of India and their distribution, Sanctuaries and National parks, Red data book. Gene pool.
5. Ecotourism in wilderness and protected area network.

**Suggested Readings:**
Global Biodiversity - W.R. L. IUCN
Ecology of natural resource - Ramade
Ecology - P.D. Sharma
Conservation Ecology- G.W.Cox.

**Course Title: Environmental Issues, Awareness and Monitoring**
**Course Code: FS-ENV-EO-403 (a)**

**Course Objectives:** It strives on contemporary environmental issues within or outside the country by disseminating knowledge at local level.

**Course Description:** It sensitize and provides the overall knowledge of environmental problems as contemporary issues and promulgated for public participation, as these issues are generalized with environmental policies in India or International Level.

**Course Outcome:**

**CO1:** Gain insights into the politics of environmental issues at the national and international levels.

**CO2:** Debate on environmental policies and regulations and environmental movements in India.

**CO3:** Empowers with the methods of communication to the masses and consumers for environmental issues.

**CO4:** Develop global perspective on the scenario of environmental education and communication at the national and international levels.

**CO5:** Lay foundation of environmental communication, education and interpretations to achieve the goal of sustainable development, protection of environment, and conservation of biodiversity and eCOsystem.

**CO6:** Develop perspective on important environmental issues that have become a matter of global policy making, international negotiations and trade disputes.

**CO7:** Develop critical thinking on the links between environment, property regimes, trade and information economics.

### Unit I

Environmental Issues: Environmental Ethics and Global imperatives.

Global Environmental problems: Ozone depletion, global warming and climatic change, Greenhouse gases, Acid rains, Oil spills, Rain water harvesting and Groundwater recharge. Eutrophication and restoration of lakes. Wetlands conservation.

Nuclear fallout, Nuclear and radiation accidents, Nuclear safety , Electronic waste. Intensive farming, Overgrazing, Soil conservation, Soil erosion, Soil salination,

### Unit II

Current Environmental issue in Indian Context: Narmada Dam, Tehri Dam, Almetti Dam, Soil Erosion. Formation and reclamation of Usar, Alkaline and Saline Soil. Waste lands and their reclamation, Floods and Drought.

Environmental priorities in India and sustainable development. Environmental education and awareness, role of governmental and non-governmental organizations.Environmental issues with war, Genetically modified food controversies, Overpopulation, Gender Imbalance. Epidemiological issues (e.g., Goitre, Fluorosis, Arsenic),

### Unit III

Environmental Conservation Practices: Traditional Practices, Modern Practices. Environmental Monitoring: Air, Water, Soil, Monitoring of Natural Resources and Biodiversity.

Introduction of Geographical Information System (GIS): Definition, Components of GIS and Application of GIS in various fields

**Suggested Readings:**

Botkin, Daniel B. and Keller, Edward A. Environmental Science: Earth as a Living Planet. 6th ed. John Wiley & Sons, USA. 2007.

Cunningham, W. P. and Cunningham, M. A. Principles of Environment Science. Enquiry and Applications. 2nd ed. Tata McGraw Hill, New Delhi. 2004.

Rajagopalan, R. Environmental Studies: From crisis to cure, Oxford University Press, New Delhi, 2008.

Richards, I. S.Principles and Practice of Toxicology in Public Health. Jones and Bartlett Publishers, London. 2008.

Singh, J.S., Singh, S.P. and Gupta, S.R. Ecology, Environment and Resource Conservation. Anamaya Publishers, New Delhi, India. 2006.

UNEP. Global Environment Outlook 3. Geneva: UNEP, Global Resource Information Division. 2003.

World Commission on Environment and Development (WCED): Our Common Future, Oxford University Press, London. 1987.

### Course Title: Waste Management
### Course Code: FS-ENV-EO-403 (b)

**Course Objectives:** How the waste can managed to conceptualize the theme of silver from sewage and gold from garbage.

**Course Description:** The contents strive on various types of waste in consonance of their classification, composition and characteristics. It also emphasizes on storage, collection, transport and disposal aspects of waste as implied by various management strategies.

**Course Outcome:**

**CO1:** Describe the components of solid waste management.

**CO2:** Explain solid waste collection systems, waste transportation & processing techniques.

**CO3:** Examine the waste treatment technologies.

## Unit-I

Generation and characteristics of waste: Sources, types, composition, quantity, sampling and characteristics of waste, factors affecting generation of solid wastes. Proximate and ultimate analysis of solid wastes.

## Unit-II

Waste collection, storage and transport: Methods of municipal solid waste collection, On site storage methods, transfer station and transportation methods, Solid waste processing and recovery – Recycling, recovery of materials for recycling and direct manufacture of solid waste products. Electrical energy generation from solid waste (Fuel pellets, Refuse derived fuels), composting and vermicomposting, biomethanation of solid waste. Disposal of solid wastes – sanitary land filling and its management, incineration of solid waste

## Unit-III

Industrial waste, Hazardous waste, Electronic waste, Biomedical waste-characteristics, treatment and disposal. Plastic waste disposal, Fly ash: Sources, composition & utilization. Municipal solid waste in Indian conditions.

**Suggested Readings:**

1. Solid Waste Management CPCB. New Delhi.

2. Ecotechnology for pollution control & environmental management - By R.K. Trivedi & Arvind Kr.

3. Basic Environmental Technology - J.A. Nathanson

## Course Title: Dissertation
## Course Code: FS-ENV-CC-404

**Course Objectives:** To access the analytical capacity of the student by using investigation on various environmental problems around the vicinity.

**Course Description:** A case study pertaining to environmental problem or EIA based studies exercised by individual students to find out the result of their research area and having systematic presentation of their findings.

**Course Outcome:**

**CO1:** Plan and engage in an independent investigation of a chosen research topic relevant to environment and society.

**CO2:** Systematically identity relevant concepts, methodologies, techniques and conclusions..

**CO3:** Able to do critical review.

**CO 4:** Communicate research concepts & contexts effectively both orally and in writing.

The student will select a topic of research in consultation with his/her supervisor/guide to do a research work or carry out a case study on any topic related to environmental sciences.
The student shall prepare a report of his/her work carried out. The external examiner will evaluate the work carried out and shall award the marks accordingly.

**Suggested Readings:**

Work on the Dissertation topic initiated in Semester III with seminar presentation is to be completed with report submission by the end of semester IV.

1. Bucchi, M. and B. Trench, editors. 2008. Handbook of Public Communication of Science and Technology. Routledge.

2. Bella Mody 2001 Designing Messages for Development Communication –An Audience participation-based approach. SAGE Publications.

3. Robert, A.D. and G. Barbara. 2006. How to Write and Publish a Scientific Paper, 6th Edition. Cambridge University Press.

4. Soraya, M.C. and A.S. Cynthia. 2001. Proposal Writing. Sage Publications.

5. Gregory, J. and S. Miller. 1998. Science in Public: Communication, Culture and Credibility. Plenum.

6. Holliman, R., et al., editors. 2009. Investigating Science Communication in the Information Age: Implications for Public Engagement and Popular Media. Oxford University Press.

7. Nelkin, D. 1995. Selling Science: How the Press Covers Science & Technology, 2nd Edition. WH Freeman.

8. Hoffmann, Angelika H. 2009. Scientific Writing and Communication: Papers, Proposals, and Presentations. Oxford.

9. Field, Anthony. 2003. How to Design and Report Experiments. Sage Publications.

10. Glass, David. 2006. Experimental Design for Biologists. Cold Spring Harbor Laboratory Press.

11. Underwood, A.J. 1997. Experiments in Ecology: Their Logical Design and Interpretation Using Analysis of Variance. Cambridge.

**Practical**
**Course Code: FS-ENV-CP-405**

**Environmental Monitoring**

1. Determination of particle size using respirable dust sampler.
2. Determination of PM 2.5 using fine particle sampler.
3. Respirable Suspended Particulate Matter (RSPM) by Respirable suspended particulate matter sampler (RDS APM 460)

4. Dust retaining capacity of plants.
5. Measurement of noise.
6. Estimation of BOD
7. Estimation of COD
8. Estimation of Chlorophyll
9. Estimation of Total, organic and inorganic carbon
10. GPS – Application in field
11. Estimation of Biodiversity
12. Site visit to degraded landscapes/habitats- terrestrial and aquatic.
13. Visit to restored/ managed habitats & study of their practices.
14. Field use of contour Marker for alignment of contour lines on the ground.
15. Visit to watershed area, to study different characteristics of watershed preferably in rainy season.

**Advanced Instrumental Techniques:**
1. Flame photometery
2. UV-Visible Spectrophotometry
3. Atomic Absorption Spectrophotometry

**Case Study:** Related to Pollution Monitoring, Treatment and Control; Environmental Impact Assessment; Resource recycling and reclamation; Biodiversity and its conservation.

## Teaching Learning Process & Blended Learning

• Lectures, Discussions, Simulations, Role Playing, Participative Learning, Interactive, Sessions, Seminars, Research-based Learning/Dissertation or Project Work, Technology-embedded Learning.

• Herbarium preparation, field research report, Participation in seminars/conferences, celebration of events related to environment, Script/play on environmental issues, social responsibility and community participation.

## Assessment and Evaluation

• Continuous Comprehensive Evaluation will be adopted to find out each course-level learning outcome i.e. Assignment, Test, Quiz, Seminars.
• Formative Assessment on the basis of the activities of a learner throughout the program instead of one-time assessment.
• Individual Assignments i.e. Case Study, Practical Record, Dissertation.
• Seminar Presentation, Field/Excursion report writing

**(A) Theory Courses – 50 Marks**
**I. Internal Assessment – 10 Marks**
    (a) Test – 04 Marks
    (b) Term paper – 04 Marks
    (c) Overall performance – 02 Marks

**II. External Assessment – 40 Marks**

## (B) Practical Courses – 100 Marks

### Distribution of Credit

| Semester | I | II | III | IV | Total |
|---|---|---|---|---|---|
| Credit | 25 | 25 | 25 | 25 | 100 |

| Academic Year | Semester | Core Compulsory | Core Elective | Open Elective | Foundation |
|---|---|---|---|---|---|
| Credit Distribution | I and II | 80% | - | - | 20% |
| | III and IV | 40% | 40% | 20% | - |

1 Credit = 10 Marks

### Evaluation (Calculation of Score)
Credits & Marks (Theory)
Course Credit = 5
Total Marks = 50

Credits & Marks (Practical)
Course Credit = 10
Total Marks = 100

### Grading

| Grade Points | Description | % of Marks | Division | Grade |
|---|---|---|---|---|
| 10 | Outstanding | 90-100 | First | O |
| 9 | Excellent | 80-89 | First | A+ |
| 8 | Very Good | 70-79 | First | A |
| 7 | Good | 60-69 | First | B+ |
| 6 | Above Average | 50-59 | Second | B |
| 5 | Average | 40-49 | Third | C |
| 4 | Pass | 36-39 | Pass | P |
| 0 | Fail | Below 36 | Fail | F |
| 0 | Absent | - | - | Ab |

### Performance Evaluation (Calculation)
(i) Semester Grade Point Average (SGPA)

SGPA (Si) = $\Sigma$ (Ci X Gi) / $\Sigma$ Ci
Where Gi = Grade
Ci = Credit of Course

(ii) Cumulative Grade Point Average (CGPA)

CGPA = Sum of Credits X SGPA of Entire Program/ Sum of Credits up to the end of program

(iii) Conversion of CGPA into Percentage

Percentage % = 9.5 X CGPA (Adopted from CBSE pattern where 9.5 means that percentage should not greater than 95%)

OR

* Conversion of CGPA into Percentage is subject matter of examinations section of the university.