Maharaja Ganga Singh University, Bikaner

SYLLABUS

M.A. /M. Sc. in GEOGRAPHY (Semester)

(Choice Based Credit System)

Session: - 2025-26
2026-27

Background

Considering the curricular reforms as instrumental for desired learning outcomes, all the members of the Board of Studies made rigorous attempts to revise the curricula of Postgraduate Programmes in alignment with National Education Policy-2020 and UGC Quality Mandate for Higher Education Institutions2021. 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 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 curricula 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; 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, Members of the Board of Studies, and Deans of Schools of Study. 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.

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.

Program Objectives:

1. To disseminate knowledge of Earth's highly varied physical environment.

2. To provide an understanding of mankind's adaptation to, and settlement in, varied environmental settings.

3. To enhance an understanding of the spatial organization at local, regional, and global scales.

4. To provide practical training on the use of survey instruments and geo-spatial analytical techniques for Geographical analyses.

5. To sensitize students about the unprecedented pace and scale of adverse environmental impact of human activities during last 100 years.

6. To empower students with spatial analysis and decision-making skill sets which help promotion of sustainable development and environmental conservation.

7. To prepare students for successful careers in academic and research institutes, as technical advisors to administrative departments dealing with spatial decision making, geo-spatial consultants to industries, businesses and NGOs.

Programme Outcomes (PO)

The PG Courses of Faculty of Social Science will be able:

PO	Description
PO1	To acquaint students with recent knowledge and techniques in social and applied spatial sciences.
PO2	To develop understanding of environmental and socio-cultural basis of life.
PO3	To provide insight into ethical implications of scientific research for sustainable development and environmental protection.
PO4	To develop problem solving innovative thinking with robust communication and writing skills in youth.
PO5	To understand application of spatial knowledge 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 for self-reliance.

Program Specific Outcome (PSO)

PSO	Description
PSO-1	To contribute to sustainable development and wise use of resources for benefit of society through education and research on environment with an inter-disciplinary approach with focus on spatial relationships.
PSO-2	To provide knowledge on natural and built environments and their dynamic interaction for promotion of the quest of sustainability.
PSO-3	To create awareness on forest and biodiversity conservation, global warming and climate Change, and human adaptation possibilities and strategies.
PSO-4	To educate students on assessment of environmental footprint of human activities in simple to complex socio-economic setups.
PSO-5	To give knowledge on concepts, tools and modern techniques for mapping of Earth surface, change detection, modelling of environmental and socio-economic processes and scenario generations.
PSO-6	To educate students on urban and regional development and planning.

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, and 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 I: Four Core Compulsory Theoretical Courses, Two Practical Courses and One Foundation Course

GFC-100	Geography Foundation Course	Elementary Concepts of Geography
GCC-101	Geography Core Compulsory	Geo-tectonics and Geomorphology
GCC-102	Geography Core Compulsory	Climatology
GCC-103	Geography Core Compulsory	Oceanography
GCC-104	Geography Core Compulsory	Evolution of Geographical Thought
Practical		
GPC-105	Geography Practical Compulsory	Practical (Combined Practical for GCC - 101 and GCC-102)
GPC-106	Geography Practical Compulsory	Practical (Combined Practical for GCC -103 and GCC-104)

Semester II: Four Core Compulsory Theoretical Courses, Two Practical Courses and One Foundation Course

GFC-200	Foundation Course	National and Human Values
GCC-201	Geography Core Compulsory	Economic Geography: Concepts, Principles and Techniques
GCC-202	Geography Core Compulsory	Population Geography
GCC-203	Geography Core Compulsory	Quantitative Methods in Geography
GCC-204	Geography Core Compulsory	Environmental Geography*
	Practical	
GPC-205	Geography Practical Compulsory	Practical (Combined Practical for GCC - 201 and GCC- 202)
GPC-206	Geography Practical Compulsory	Practical (Combined Practical for GCC -203 and GCC- 204)

*Note: Students who have opted "Environmental Geography" in semester – I (2024-25) will study "Evolution of Geographical Thought" in semester – II.

Semester III: Two Core Compulsory, One Core Elective and One Elective Open Theoretical Courses, Two Practical Courses and One Foundation Course

GFC-300	Geography Foundation Course	Basic Communication Skills or Basic Computer Course or Seminar + Academic Writing
GCC-301	Geography Core Compulsory	Geo-spatial Techniques
GCC-302	Geography Core Compulsory	Geography of India
GCE-303	Geography Core Elective	A. Geography of Eurasia or B. Geography of North and South America
GEO-304	Geography Elective Open	A. Agriculture Geography or B. Geography of Health
	Practical	
GPC-305	Geography Practical Compulsory	Practical (Combined Practical for GCC - 301 and GCC-302)
GPC-306	Geography Practical Compulsory	Practical (Combined Practical for GCC -303 and GCC-304)

Semester IV: Two Core Compulsory, One Core Elective and One Elective Open Theoretical Courses, Two Practical Courses and One Foundation Course

GFC-400	Geography Foundation Course	Environmental Health and Hygiene
GCC-401	Geography Core Compulsory	Settlement Geography
GCC-402	Geography Core Compulsory	Political Geography
GCE-403	Geography Core Elective	A. Social and Cultural Geography or B. Industrial Geography
GEO-404	Geography Elective Open	A. Geography of Rajasthan or B. Regional Planning and Development
	Practical	
GPC-405	Geography Practical Compulsory	Practical (Combined Practical for GCC - 401 and GCC-402)
GPC-406	Geography Practical Compulsory	Practical (Combined Practical for GCC -403 and GCC-404)
GCE-407	In lieu of paper GCE-403 or GEO-404	Dissertation

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

	GCC 101	GCC 102	GCC 103	GCC 104	GCC 201	GCC 202	GCC 203	GCC 204	GCC 301	GCC 302	GCC 401	GCC 402
PSO1	✓		✓	✓	✓		✓		✓	✓		✓
PSO2	✓	✓				✓			✓		✓	✓
PSO3		✓		✓				✓				✓
PSO4	✓		✓	✓		✓	✓			✓		✓
PSO5			✓		✓				✓		✓	✓
PSO6	✓	✓		✓	✓						✓	✓

(iii) Programme Specific Outcome (PSO) and Elective Courses

	GCE 303 A	GCE 303 B	GEO 304 A	GEO 304 B	GCE 403 A	GCE 403 B	GEO403A	GEO403 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									
GFC-100	Elementary Concepts of Geography	Foundation Course	1	1	-	2 (Non-CGPA)	-	-	S/NS
GCC-101	Geo-tectonics and Geomorphology	Core Compulsory	3	1	-	4	20	80	36 %
GCC-102	Climatology	Core Compulsory	3	1	-	4	20	80	36 %
GCC-103	Oceanography	Core Compulsory	3	1	-	4	20	80	36 %
GCC-104	Evolution of Geographical Thought	Core Compulsory	3	1	-	4	20	80	36 %
Total Theory Marks							80	320	
							400		36% aggregate
Practical									
GPC-105	Practical (Combined Practical for GCC 101 and GCC-102)	Practical Compulsory	-	-	8	4	20	80	36 %
GPC-106	Practical (Combined Practical for GCC 103 and GCC-104)	Practical Compulsory	-	-	8	4	20	80	36 %
Total Credits						**24**	**Grand Total**	**600**	36% aggregate
Semester-II									
Theory Papers									
GFC-200	Human Values	Foundation Course	1	1	-	2 (Non-CGPA)	-	-	S/NS
GCC-201	Economic Geography: Concepts, Principles and Techniques	Core Compulsory	3	1	-	4	20	80	36 %
GCC-202	Population Geography	Core Compulsory	3	1	-	4	20	80	36 %
GCC-203	Quantitative Methods in Geography	Core Compulsory	3	1	-	4	20	80	36 %
GCC-204	Environmental Geography	Core Compulsory	3	1	-	4	20	80	36 %
Total Theory Marks							80	320	
							400		36% aggregate
Practical									
GPC-205	Practical (Combined Practical for GCC 201 and GCC-202)	Practical Compulsory	-	-	8	4	20	80	36 %

GPC-206	Practical (Combined Practical for GCC 203 and GCC-204)	Practical Compulsory	-	-	8	4	20	80	36 %
					Total Credits	**24**	**Grand Total**	**600**	36% aggregate
Semester-III									
Theory Papers									
GFC-300	Basic Communication Skills or Basic Computer Course or Seminar + Academic Writing	Foundation Course	1	1	-	2 (Non-CGPA)	-	-	S/NS
GCC-301	Geo-spatial Techniques	Core Compulsory	3	1	-	4	20	80	36 %
GCC-302	Geography of India	Core Compulsory	3	1	-	4	20	80	36 %
GCE-303	A. Geography of Eurasia or B. Geography of North and South America	Core Elective	3	1	-	4	20	80	36 %
GEO-304	A. Agriculture Geography or B. Geography of Health	Elective Open	3	1	-	4	20	80	36 %
							80	320	
					Total Theory Marks		400		36% aggregate
Practical									
GPC-305	Practical (Combined Practical for GCC 301 and GCC-302)	Practical Compulsory	-	-	8	4	20	80	36 %
GPC-306	Practical (Combined Practical for GCC 303 and GCC-304)	Practical Compulsory	-	-	8	4	20	80	36 %
					Total Credits	**24**	**Grand Total**	**600**	36% aggregate
Semester-IV									
Theory Papers									
GFC-400	Environmental Health and Hygiene	Foundation Course	1	1	-	2 (Non-CGPA)	-	-	S/NS
GCC-401	Settlement Geography	Core Compulsory	3	1	-	4	20	80	36 %
GCC-402	Political Geography	Core Compulsory	3	1	-	4	20	80	36 %
GCE-403	A. Social and Cultural Geography or B. Industrial Geography	Core Elective	3	1	-	4	20	80	36 %
GEO-404	A. Geography of Rajasthan or	Elective Open	3	1	-	4	20	80	36 %

	B. Regional Planning and Development								
GCE-407	Dissertation	In lieu of paper GCE-403/ GEO-404					100		36 %
Total Theory Marks							80	320	
							400		36% aggregate
Practical									
GPC-405	Practical (Combined Practical for GCC 401 and GCC-402)	Practical Compulsory	-	-	8	4	20	80	36 %
GPC-406	Practical (Combined Practical for GCC 403 and GCC-404)	Practical Compulsory	-	-	8	4	20	80	36 %
Total Credits						**24**	**Grand Total**	**600**	36% aggregate

- A candidate shall be required to obtain 36% marks to pass in theory, practical and internals separately.
- The marks of Internal Evaluation – 20 Marks theory paper, 20 Marks practical paper - should be given based on seminar/assignments/presentations/class tests/logical thinking/application of knowledge and skills, other activities etc. based on syllabus.

Scheme of Semester - End DCCT (Theory) Paper Examination

1. English/Hindi shall be the medium of instructions and examination.
2. There will be semester end examination.
3. Each Theory paper is of 100 Marks (4 Credits).
4. The evaluation scheme shall comprise external evaluation and internal evaluation. The internal evaluation will carry 20 marks while the Semester-end examination will carry 80 marks for each Theory paper.
5. The duration of the written examination for the theory paper shall be three hours.
6. A course will contain 5 units.
7. The question paper shall contain three sections.

Maximum Marks: 80 **Duration: 3 Hrs.**

Section A

(10 x 1 = 10 marks)

Section A (10 marks) shall contain 10 questions, two from each Unit. Each question shall be of 1 mark. All the questions are compulsory. Section A will be prepared such that questions (i) through (v) are multiple-choice questions, while questions (vi) through (x) will be fill-in-the-blank questions.

Section B

(5 x 5 = 25 marks)

Section B (25 marks) shall contain 5 questions (two from each unit with internal choice). Each question shall be of 5 marks. The candidate is required to answer all 5 questions. The answers should not exceed 150 words.

Section C

(3 x 15 = 45 marks)

Section C (45 marks) shall contain 5 questions, one from each Unit. Each question shall be of 15 marks. The candidate is required to answer any three questions by selecting these three questions from different units. The answers should not exceed 500 words.

Scheme of End Semester DCCP (Practical) Paper Examination

1. Each Practical Paper in Geography is combined practical for two theory papers; hence each Practical paper will carry 100 marks (4 Credits).
2. Evaluation scheme shall comprise external evaluation and internal evaluation. The internal evaluation will carry 20 marks while the end Semester examination will carry 80 marks for each Practical paper.
3. The duration of the practical examination shall be Eight hours.
4. Scheme: **8** periods per week (for each of the practical paper) per batch of **20** students.

M.A./M.Sc. Semester I

GFC-100	Elementary Concepts of Geography
GCC-101	Geo-tectonics and Geomorphology
GCC-102	Climatology
GCC-103	Oceanography
GCC-104	Evolution of Geographical Thought
GPC-105	Practical (Combined Practical for GCC 101 and GCC-102)
GPC-106	Practical (Combined Practical for GCC 103 and GCC-104)

Course Title: Elementary Concepts of Geography
Course Code: GFC – 100

Non-CGPA Course:

The student will be assessed on a **Satisfactory/Non-Satisfactory** basis through various academic components such as seminars, assignments, presentations, internal assessments, logical reasoning, application of knowledge and skills, and other syllabus-based activities.

Unit I

Subject matter of Geographical inquiry: description and explanation of spatial patterns of physical environment and cultural landscape as an interdisciplinary science.

Unit II

Attributes of Place: Location and Locality, Geometry, Geographical Environment. Ascertaining location on Earth's Surface: Determination of latitude and Longitude, Concepts of Distance, Direction and Scale.

Unit III

Evolution of mapping techniques. Age of Exploration and Discovery of Continents.

Unit IV

The dynamic relationship between Man and Environment: Determinism vs Possibilism; Dualisms in Geography: Physical and Human Geography; Land use and occupations of Man.

Unit V

Approaches to Regional study: Uniqueness of Region, Region as an Organism; Unit for Spatial Planning and Organization. Theoretical (agricultural, industrial, and central place

models) and Applied Geography (spatial diffusion and GIS based mapping and environmental simulations).

Suggested Reading:

Adhikari, S. (1992). Geographical Thought. Allahabad: Chaitanya Pub. House. Blis, H. J. (1971). Geography Regions and Concepts. New York: John Wiley of Sons INC.

Board, C., Chorley, R., & Stoddart, D. (1974). Progress in Geography.
International Reviews of Current Research Vol - 6.

Bunge, W. (1962). Theoritical Geography. London: Glenerp.

Chorley, R., & Haggett, P. (1965). Frontiers in Geographical Teaching. Oxford: OUP.

Coffey, W. (1981). Geography - Towards a General Spatial System Approach. USA: British Library Cataloguing in Pub.Data.

Dickinson, R. (1969). Makers of Modern Geography. Ludhiana: Lyall Book Depot.

Dikshit, R. (2006). Geographical Thought - A Contextual History of Ideas. New Delhi: Prentice Hall of India Private Limited.

Dikshit, R. (1994). The Art and Science of Geography:Selected Reading. New Delhi: Prentice Hall India Ltd.

Dunbar, G. (1991). Modern Geography:An Encyclopedic Survey. Chicago: St.James Press.

Freeman, T. (1971). A Hundred Years of Geography. London: Gerald Duckworth & Co.Ltd.

Gregory, D., & Walford, R. (1988). Horizons in Human Geography. London: Macmillan.

Hartshorne, R. (1968). Perspectives on the Nature of Geography. John Murray,London: Association of American Geographers,Great Britain.

Hartshorne, R. (2002). The Nature of Geography. New Delhi: Rawat Pub.Co.

Harvey, D. (2003). Explanation in Geography. New Delhi: Rawat Pub.Co.

Harvey, D. (1979). Social Justice and the City. Great Britain: The Pitman Press,Bath.

Harvey, E., & Holly, B. P. (2002). Themes in Geographical Thought. New Delhi:
Rawat Pub.Co.

Husain, M. (2007). Models in Geography. New Delhi: Rawat Pub. Co.

Hussain, M. (1995). Evolution of Geographical Thought,3rd edition. New Delhi:
Rawat Pub.co.

Hussain, M. (1994). Regional Geography. New Delhi: Anmol Pub.Ltd. Johnston, R. (2000). Geography and Geographers. London: Oxford University
Press,New York.Edward Arnold.

Johnston, R., & Hemer, J. (1990). Regional Geography:Current Developments and Future Prospects. London & New York: Routledge Publishers. Legg, S. (2007). Spaces of Colonialism. UK: Blackwell Publishing.

Massey, D. (1994). Space,Pace and Gender. Minnesota: University of Minnesota Press.

Messy, D., & Allen, J. (1984). Geography Matters:A Reader,. Cambridge: Cambridge University Press.

Moss, P. (2002). Feminist Geography in Practice Research and Methods. UK: Blackwell Pub.Co.

Murdoch, J. (2006). Post-Structuralist Geography. New Delhi: Sage Publications Limited.

Pandey, P. (1983). Modern Geographical Trends. New Delhi: Todays and Tommorow Printers andPublishers.

Peet, R. (2003). Radical Geography. New Delhi: Rawat Pub.Co.

Course Title: Geo-tectonics and Geomorphology
Course Code: GCC- 101

Time: 3 Hours **M.M. 80+20**

Unit I

Origin of Earth's Magnetic Field; Paleomagnetism; Plate Tectonics as a Unified Theory of Global Tectonics; Tectonic and Neo-tectonic processes; Earth's Interior- with special reference to Seismology; Earth Movements.

Unit II

Endogenetic Processes- Faulting and Folding; Vulcanism and associated structures.
Exogenetic Processes- Weathering, Mass Movement, Denudation, Deposition.

Unit III

Fluvial Processes: Erosional and Depositional Landforms.
Aeolian Processes: Erosional and Depositional Landforms.
Glacial Processes: Erosional and Depositional Landforms.
Marine Processes: Erosional and Depositional Landforms.

Unit IV

Models of Landform development by Hutton, Davis, Penck, and King.
Application of Geomorphology in Feasibility Assessment of Engineering and Industrial Projects.
Application of Geomorphic knowledge to Hazard Risk Assessment studies.

Unit V

Concept of Morphogenetic Region - classification schemes and characteristics.
Regional geomorphology of Thar Desert, Aravalli Region, Hadoti Plateau, Deccan Trap, Chhota Nagpur Plateau, Western Ghats.

Suggested Readings:

Ahmed, E., 1985, Geomorphology, Kalyani Publishers, New Delhi.
Ahmed, E., 1972, Coastal Geomorphology of India, Orient Longman.
Chorley, R., Schumm, S. and Sugden, D.E. 1994. Geomorphology, Methuen, London.
Cook and Doorncamp. 1988. Geomorphology in Environment Management, London
Dayal, P., 1995, A Textbook of Geomorphology, Shukla Book Depot. Patna
Dury, G.H.,1967, Essays in Geomorhology, Heinemann Educational Books Ltd, London
Faniran, A. and Jeje, L.K. 1983. Humid Tropical Geomorphology, Longman, London
Fairbridge, R.W., 1968, The Encyclopaedia of Geomorphology, (Edge), Rainhold Book Corporation,
New Youk
Goguel, J. and Thalmann, H. E., 1962, Tectonics, W.H.Freeman and Compnay
Kale, V.S. and Gupta, A. 2001. Introduction to Geomorphology, Orient Longman Ltd., Hyderabad
Knighton, D.1998: Fluvial Forms and Processes: A New Perspective, Arnold, London
King, L.C., 1965 Morphology of the Earth, Oliver and Boyd, Edinburgh.

Leopold,L.B., et al, 1964, Fluvial Processes in Geomorphology, Eurasia Publishing House, New Delhi.
Mitchell, C.W 1991. Terrain Evaluation, 2nd edition, Longman Scientific & Technical, Harlow
Morisawa, M. (editor) 1994. Geomorphology and Natural Hazards, Elsevier, Amsterdam.
Morisawa, M. 1985. Rivers, Longman, London.
Melhorn, W.N. and R. C. Flemal, 1975, Theories of Landform Development, George Alen and Unwin.
Ollier, C.D. 1981: Tectonic Geomorphology, Longman Scientific & Technical, London.
Petts, G. and Foster, I. 1985. Rivers and Landscapes, Edward Arnold, London.
Petts, G.E. and Amoros, C. (editors) 1996. Fluvial Hydrosystems, Chapman and Hall, London.
Rice, R.J. 1988. Fundamentals of Geomorphology, 2nd edition, Longman Scientific and Technical, London.
Selby, M.J. 1985. An Introduction to Geomorphology, Clarendon, Oxford.
Sharma, H.S. 1987. Tropical Geomorphology: A Morphogenetic Study of Rajashan, South Asia Books, Jaipur.
Starkel, L. and Basu, S. 2000 Rains, Landslides and Floods in the Darjeeling Himalaya, Indian National Science academy, New Delhi.
Strahler, A. N. and Strahler, A. H., 1978, John Wiley and Sons, New York
Summerfield, M.A. (Editor) 1991. Global Geomorphology: An Introduction to the Study of Landforms, John Wiley and Sons Ltd., New York.
Singh, Savindra, 2000. Geomorphology, Prayag Pustak Bhavan
Thornbury, W.D. 1969. Principles of Geomorphology, Wiley Eastern Limited, New Delhi.
Tinkler, 1985. A Short History of Geomorphology, Croom Helm Ltd., Beckenham.
Valdiya, K.S. 1998. Dynamic Himalaya, University Press (India) Ltd., Hyderabad.
Wilson, J.P. and Gallant, J.C. (editors) 2000. Terrain Analysis: Principles and Applications, John Wiley, and Sons Ltd. New York.
Wirthmann, A. 2000. Geomorphology of the Tropics, Translated by Busche, D. Springer-Verlag, Berlin.
Wooldridge, S.W., 1965, An Outline of Geomorphology, Longman Young, A., 1972, Slopes, T. and A. Constable Ltd, Edinburgh

Course Title: Climatology
Course Code: GCC -102

Time: 3 Hours **M.M. 80+20**

Unit I

Composition and Structure of atmosphere. Insolation: latitudinal distribution over the Earth. Geographic Influences on Temperature distribution over Earth surface. Temperature: Environmental Lapse Rate and Inversion.

Unit II

Pressure and Wind Distribution. Forces controlling Motion of air. General Circulation in the atmosphere. Jet Stream. Local Winds. Adiabatic processes and Instabilities. Evaporation and cloud formation. Precipitation- causes, forms, types. Spatial distribution of Precipitation over the Earth

Unit III

Air Masses and Fronts- types, characteristics, and weather conditions. Tropical Cyclones- Distribution, Characteristics and Origin. Temperate Cyclones- Distribution, Characteristics and Origin. Monsoon- Characteristics and Theories of Origin.

Unit IV

Extreme Weather Events- Cloudbursts, Tornado, Typhoons, Hailstorms, Windstorms, Heat Wave, Cold Wave, Fog.

Ocean-Atmospheric Interaction- El Nino, Southern Oscillation (ENSO) and La Nina.

Climatic classification schemes of Koeppen and Thornthwaite. Salient characteristics of different Climatic types identified by Koeppen.

Unit V

Global Warming- Causes and evidence. Climate Change: theories of astronomical and anthropogenetic causes. Climate Change – Spatial variations in Environmental and Social Impacts. Climate Change – Mitigation and Adaptation Strategies.

Urban Heat Island; Concept of Heat Index

Suggested Readings:

Anthes, R. 1997: Meteorology, 7th edition, Prentice-Hall Inc., Upper Saddle River Barry, R.G. and Chorley, R.T. 1992: Atmosphere, Weather and Climate, 6th edition, Routledge, London

Brigg, G.R. 1996 : The Ocean and Climate, Cambridge University Press, Cambridge

Cock, N.K. 1995 : Geohazards: Natural and Human, Prentice Hall, Englewood Cliffs Critchfield, H.J.

1983: General Climatology, 4th edition, Prentice Hall India Ltd., New Delhi

Das, P.K. 1995 : Monsoons, 2nd edition, National Book Trust, New Delhi

Elsom, D.M. 1992 : Atmospheric Pollution: A Global Problem, 2nd edition, Blackwell Pub. Co., London

Lal, D.S. 1993 : Climatology, 3rd edition, Chaitanya Pub. House, New Delhi

Linacre, E. and Geerts, B. 1997 : Climates and Weather Explained, Routledge, London

Lutgens, F.K.. and Tarbuck, E.J. 1998 : The Atmosphere: An Introduction to Meteorology, 7th edition, Prentice-Hall Inc., Upper Saddle River

Moran, J.M. and Morgan, M.D. 1997 : Meteorology: The Atmosphere and the Science of Weather, 5th edition, Prentice-Hall Inc.

Pant, G.B. and Kumar, R.K. 1997: Climates of South Asia, John Wiley and Sons Ltd., Chichester

Smith, K. 1996 : Environmental Hazards: Assessing Risk and Reducing Disaster, 2nd edition, Routledge, LondonTaylor, J.A. (editor) 1974 : Climatic Resources and Economic Activity, David & Charles, London

Byers H .R. 1959: General Meteorolgy, Mcgraw Hill Book Company

Oliver J.E. & Hioddore J.J, 2003.: Climatology: An atmospheric science, Pearson Lal, M, 1993: Global Warming: concern for tomorrow,Tata Mcgraw Hill

Course Title: Oceanography
Course Code: GCC-103

Time: 3 Hours **M.M. 80+20**

Unit-I

Scope of Oceanography and Its Interdisciplinary Linkages with Environmental Sciences. Formation of Ocean Basins: Wegener's Continental Drift Theory, Seafloor Spreading, and Plate Tectonic Framework. Global Distribution of Land and Oceans and Their Influence on Climatic Patterns.

Unit-II

Key Features and Morphological Characteristics of the Ocean Floor: Continental Shelf, Continental Slope, Oceanic Ridges, Abyssal Plains, Submarine Canyons, and Deep-Sea Trenches. Regional Configuration of the Ocean Basins: Indian, Pacific, Atlantic, and Arctic Oceans.

Unit-III

Temperature Variations in Ocean Waters: Horizontal and Vertical Profiles – Causes and Influences. Salinity and Density Patterns in the Oceans – Driving Factors and Significance. Coral Reefs – Theories of Origin and Global Distribution.

Unit IV

Tides: Theories and Their Environmental Relevance. Ocean Currents: Patterns of Warm and Cold Currents – Influence on Regional Climate and Economic Activities. Marine Fisheries: Global Distribution, Development Potential, and Associated Challenges. Fossil Fuel Resources in Ocean Basins: Opportunities and Environmental Considerations.

Unit V

Global Warming and Sea-Level Rise: Scientific Evidence, Processes, and Consequences. Marine Pollution: Sources, Types, and Environmental Implications. Renewable Energy Potential: Harnessing Wave and Tidal Energy – Opportunities and Challenges. Tsunamis: Coastal Vulnerability, Risk Assessment, and Mitigation Strategies.

Suggested Readings:

Denny, M., 2008, How the Ocean works: An introduction to Oceanography, Princeton University Press, New Jersey.

Garrison, T., 1995, Essentials of Oceanography Wardsworth Pub. Co., London.

S. Kerhsaw., 2004, Oceanography: An Earth Science Perspective, Routledge, UK. Sharma, R.C. and V. Vatal., 1986. Oceanography for Geographers, Chatanaya Publishing, Allahabad.

Shepart, F., 1969, The Earth Beneath the Sea, Athneum, Rev. ed., New York.

Singh, Savindra., Oceanography, 2014, Pravalika Publications, Allahabad. Thurman, V. Harold., 1987, Essentials of Oceanography, A Bell & Howell Company, Columbus/ Toronto/ Sydney.

Von Arx, W.S., 1962, An Introduction to Physical Oceanography, Addison, Wesley, New York

Course Title: Evolution of Geographical Thought
Course Code: GCC -104

Time: 3 Hours **M.M. 80+20**

Unit-I

Geography: Definition, Scope, and Subject Matter. Evolution of Geographical Thought: Contributions from Ancient Civilizations- Greek Scholars: Key contributions by Homer, Thales, Hecataeus, Anaximander, Herodotus, Eratosthenes, and Posidonius in shaping early geographical understanding; Roman Scholars: Significant works of Strabo and Ptolemy in classical geography.

Geographical Knowledge in Ancient Indian Texts: The Vedas: Insights into spatial understanding and natural phenomena; The Puranas: Descriptions of continents, oceans, mountain ranges, and river systems.

Growth of Geographical Thought in India: Historical development and indigenous contributions to the field of geography.

Unit-II

The Dark Ages in Europe: Influence on the Decline and Stagnation of Geographical Knowledge and Scientific Inquiry.

Islamic Contributions during the Middle Ages: Advancements in the Understanding of Climate Systems, Geological and Geomorphic Processes, and the Cartographic Mapping of Known areas of Asia, Europe, and Africa.

The Age of Exploration: Landmark Voyages by Columbus, Vasco da Gama, Marco Polo, Magellan, and Captain Cook – Discovery of New Continents, Island Groups, and the Establishment of Overland and Maritime Trade Routes between Europe and Asia.

The Rise of Modern Cosmology: Emergence of the Heliocentric Theory in the 16th and 17th Centuries – Pioneering Contributions by Copernicus, Kepler, Galileo, and Newton in Shaping the Modern Understanding of the Universe

Unit-III

Foundations of Scientific Geography: The Rise of Geography as a Systematic and Empirical Discipline during the 18th and 19th Centuries. Pioneering Thinkers: Influential Contributions by Immanuel Kant, Alexander von Humboldt, and Carl Ritter in Shaping the Philosophical and Methodological Base of Modern Geography

Key Contributors to the Development of Modern Geographical Thought:
German and French Scholars: Friedrich Ratzel, Alfred Hettner, Ferdinand von Richthofen, Paul Vidal de la Blache, and Jean Brunhes.

British and American Geographers: Halford Mackinder, L. Dudley Stamp, Ellen Churchill Semple, Ellsworth Huntington, William Morris Davis, Carl Sauer, Isaiah Bowman, David Harvey, and Griffith Taylor

Uint IV

Major Paradigms in Geographical Thought:
Environmental Determinism.
Areal Differentiation.
Positivism and the Quantitative Revolution.

Locational Analysis.
Behavioral Geography.
Radical Geography and the Rise of Critical Perspectives.
Humanistic Geography.

Unit V

Contemporary Debates and Evolving Perspectives in Geography:
Foundational Dualisms in Geography: Environmental Determinism vs. Possibilism, Physical Geography vs. Human Geography, Regional Approach vs. Systematic Approach, Idiographic (Descriptive) vs. Nomothetic (Generalizing) Approaches, Theoretical Geography vs. Applied Geography.

Emerging Approaches in Human Geography:
The Welfare Perspective.
Geography of Equality, Social Justice, and Environmental Justice.
Feminist Geography.
The Transformative Impact of Advances in Geo-spatial Technologies on Geographic Inquiry and Applications.
Postmodernism in Geography.
Diverse Perspectives on the Nature of Geography as a Discipline.

Suggested Reading:

Adhikari, S. (1992). Geographical Thought. Allahabad: Chaitanya Pub. House. Blis, H. J. (1971). Geography Regions and Concepts. New York: John Wiley of Sons INC.
Board, C., Chorley, R., & Stoddart, D. (1974). Progress in Geography.
International Reviews of Current Research Vol - 6.
Bunge, W. (1962). Theoritical Geography. London: Glenerp.
Chorley, R., & Haggett, P. (1965). Frontiers in Geographical Teaching. Oxford: OUP.
Coffey, W. (1981). Geography - Towards a General Spatial System Approach. USA: British Library Cataloguing in Pub.Data.
Dickinson, R. (1969). Makers of Modern Geography. Ludhiana: Lyall Book Depot.
Dikshit, R. (2006). Geographical Thought - A Contextual History of Ideas. New Delhi: Prentice Hall of India Private Limited.
Dikshit, R. (1994). The Art and Science of Geography:Selected Reading. New Delhi: Prentice Hall India Ltd.
Dunbar, G. (1991). Modern Geography:An Encyclopedic Survey. Chicago: St.James Press.
Freeman, T. (1971). A Hundred Years of Geography. London: Gerald Duckworth & Co.Ltd.
Gregory, D., & Walford, R. (1988). Horizons in Human Geography. London: Macmillan.
Hartshorne, R. (1968). Perspectives on the Nature of Geography. John Murray,London: Association of American Geographers,Great Britain.
Hartshorne, R. (2002). The Nature of Geography. New Delhi: Rawat Pub.Co.
Harvey, D. (2003). Explanation in Geography. New Delhi: Rawat Pub.Co.
Harvey, D. (1979). Social Justice and the City. Great Britain: The Pitman Press,Bath.
Harvey, E., & Holly, B. P. (2002). Themes in Geographical Thought. New Delhi: Rawat Pub.Co.
Husain, M. (2007). Models in Geography. New Delhi: Rawat Pub. Co.
Hussain, M. (1995). Evolution of Geographical Thought,3rd edition. New Delhi:

Rawat Pub.co.
Hussain, M. (1994). Regional Geography. New Delhi: Anmol Pub.Ltd. Johnston, R. (2000). Geography and Geographers. London: Oxford University
Press,New York.Edward Arnold.
Johnston, R., & Hemer, J. (1990). Regional Geography:Current Developments and Future Prospects. London & New York: Routledge Publishers. Legg, S. (2007). Spaces of Colonialism. UK: Blackwell Publishing.
Massey, D. (1994). Space,Pace and Gender. Minnesota: University of Minnesota Press.
Messy, D., & Allen, J. (1984). Geography Matters:A Reader,. Cambridge: Cambridge University Press.
Moss, P. (2002). Feminist Geography in Practice Research and Methods. UK: Blackwell Pub.Co.
Murdoch, J. (2006). Post-Structuralist Geography. New Delhi: Sage Publications Limited.

Course Title: Practical (Combined Practical for GCC-101 and GCC-102)
Course Code: GPC – 105

Distribution of marks:	**Marks**
1. Lab work/ Written work: 4 hrs duration	40
2. Record work & viva- voce: 1 hr duration	10 +5 =15
3. Field Visit & viva-voce: 1 hr duration	08 +2 =10
4. Field Survey & viva-voce: 2 hr duration	10 + 5= 15
5. Internal Evaluation	20
Total	100

Note: The candidate is required to answer/attempt any 4 exercises (10 marks each) out of 6 exercises during Lab Work/ Written work and 20 candidates shall be examined in one batch.

Map Scaling and Area Measurement: Principles and techniques of enlargement and reduction of maps; determining area using Planimeter/Digital Planimeter and Pantograph.

Representation of Relief Features: Various cartographic methods for depicting terrain, including Spot Heights, Contours, Layer Shading and Tinting, Hachures, Form Lines, Hill Shading, Cliff and Rock Drawing, Clinographic Curves, and Block Diagrams.

Depiction of Descriptive Topography: Use of contours and supplementary methods for representing described terrain.

Topographical Map Interpretation: Understanding the numbering system of topographical maps and interpreting key geographical elements such as landforms, relief, drainage patterns, vegetation, transportation networks, and settlement structures from topographical maps representing:

(a) The Himalayan Belt
(b) Coastal Areas

(c) Northern Plains
(d) Peninsular Plateau
(e) Thar Desert
Preparation of overlays based on topographical maps.

Profile Drawing and Analysis: Construction and interpretation of various types of topographic profiles: Serial, Superimposed, Projected, and Composite profiles.

Field Training Component: A one-day field visit will be organized to facilitate on-ground identification of geographical features using topographical maps, cadastral maps, and Google Earth imagery. Each student is required to submit a field report based on their observations.

Plane Table Surveying: Hands-on application of Radiation and Intersection methods for basic land surveying.

Course Title: Practical (Combined Practical for GCC-103 and GCC-104)
Course Code: GPC – 106

Distribution of marks:	**Marks**
1. Lab work/ Written work: 4 hrs duration	40
2. Record work & viva- voce: 1 hr duration	10 +5 =15
3. Field Visit & viva-voce: 1 hr duration	08 +2 =10
4. Field Survey & viva-voce: 2 hr duration	10 + 5= 15
5. Internal Evaluation	20
Total	100

Note: The candidate is required to answer/attend any 4 exercises (10 marks each) out of 6 exercises during Lab Work/ Written work and 20 candidates shall be examined in one batch.

Contour Mapping from Point Data: Methods of interpolation and extrapolation for generating contour lines from spot height data.

Slope and Drainage Analysis: Techniques for slope determination using the Robinson and Wentworth methods; drainage basin analysis including stream ordering and understanding the concept of gradient and intervisibility between points.

Fluvial Morphometry: Application of morphometric techniques in fluvial studies; preparation of altimetric frequency curves and hypsometric curves for drainage basin analysis.

Representation of Weather and Climatic Data: Construction and interpretation of various climatic diagrams including Isotherms, Isobars, Isohyets, Climographs, Hythergraphs, Climatographs, Ergographs, Wind Rose Diagrams, and Rainfall Dispersion Diagrams. Introduction to Aridity Index and Heat Index concepts.

Meteorological Instruments and Weather Map Interpretation: Identification and function of instruments used to measure weather and climatic elements. Study of the components of Indian Daily Weather Maps and techniques for their interpretation.

Field Visit Component: A one-day field visit will be arranged to a nearby meteorological observatory/laboratory to observe the operation of key meteorological instruments. Each student is required to submit a field report based on their observations and learning.

Plane Table Surveying: Hands-on application of traversing and resection methods for basic land surveying.

Suggested Readings:

Barry Kavanagh and Frank W. G. T. Bailey “Surveying for Construction”

Charles D. Ghilani and Paul R. Wolf “Elementary Surveying: An Introduction to Geomatics” Basak N. N. “Surveying and Levelling”

Charles L. Cheetham “Introduction to Geodetic Surveying”

Chauhan, P. R. “Practical Geography” Wasundhara Prakasan Gorakhpur.

David M. Clark “Engineering Surveying”

Dickinson, G.C.: Statistical mapping of statistics, London

Dorling, D. and Fairbirn, D. 1997: Mapping Ways of Representing the World, Longman. England.

Kanetkar, T.P. "and Kalkarni, S.V. Surveying and Leveling" part 1, Page 355

Kellaway, G. P. 1970: Map Projections, Methun and Co. Ltd., London.

Khan, Z A: Text book of Practical Geography, Concept, New Delhi, 1998.

Lawrence, GRP: Cartographic Methods, London, 1971.

Maceachren, A. M. and Taylor, D. R. F. 1994: Visualization in Modern Cartography, Permamon. UK.

Monkhouse F.J. and Wilkinson, H.R. 1971: Maps and Diagrams: Their Compilation and Construction, B.I. Publications Private Limited, New Delhi.

Monkhouse, FJ & Wilkinson HR: Map & Diagram, Methuen, London, 1994.

Robinson AH et,al. : Elements of Geography, John Willey, New York, 1995.

Sarkar, A K: Practical Geography: A Systematic Approach, Oriental Longman, Calcutta, 1997.

Saroj K. Pal: statistics for Geosciences- Techniques and applications, Concept, New Delhi, 1998.

Singh LR. & Singh R. Mapwork and Practical Geog. p. 154

M.A./M.Sc. Semester II

GFC-200	Human Values
GCC-201	Economic Geography: Concepts, Principles and Techniques
GCC-202	Population Geography
GCC-203	Quantitative Methods in Geography
GCC-204	Environmental Geography*
GPC-205	Practical (Combined Practical for GCC 201 and GCC-202)
GPC-206	Practical (Combined Practical for GCC 203 and GCC-204)

*Note: Students who have opted "Environmental Geography" in semester – I (2024-25) will study "Evolution of Geographical Thought" in semester – II.

Course Title: Economic Geography: Concepts, Principles and Techniques
Course Code: GCC-201

Time: 3 Hours **M.M. 80+20**

Unit I

Definition, Scope, and development of Economic Geography.
Economic activities and sectors (primary, secondary, tertiary, and quaternary).
Concept of economic development, indicators of development,
Geographical basis of economic activities: systematic approach and spatial approach.

Unit II

Von Thunen's model of agriculture location and its modification.
Agricultural Regions- Concepts and techniques of Delineation;
World Agricultural Systems and Regions.

Unit III

Industrial Location theories: Weberian Location analysis; Losch's economics of locations; Isard's space economy.
Spatial Distribution of Iron & Steel, Cotton Textile, Petro Refining Industries, Technology Industries;
Major Industrial Regions of the World;

UNIT IV

Primate City, Rank Size Rule, Christaller's Theory of Central Places;
Spatial Patterns of Urbanization in Developed and Developing countries
Basic Elements of World Economy;
Spatial Structure of World Economy.
Sustainable development, Human Development.

Concept of Accessibility and Connectivity; Transportation: Modes, Comparative Cost Advantage; Networks- Types and Network Graphs; Connectivity of Networks and their Measurement Indices.

UNIT V

GATT and World Trade Organization (WTO),
Significance of Globalization in World and Regional Economies.
Concept of Economic region;
Techniques of delimitation of economic regions,

Suggested Readings:

Alexander, J.W. (1963) Economic Geography, Prentice - hall Inc
Boyce, Ronald Reed (1974) The Bases of Economic Geography, Holt, Rine Hart and Winston Inc, New York.
Brereton, E. 1992: Resource Use and Management, Cambridge University Press, Cambridge.
Datt, R. & K.P.M. Sundaram (2006) Indian Economy, Prentice - hall Inc
Elliotte, j. A. 1994: An Introduction to Sustainable Development: The Developing World, Routledge, London.
Hurst, Michael E. Eliot (1974) Transportation Geography: Comments and Readings, Mc. Graw-Hill Book Company Ltd.
Johnston, R.J., Taylor, P.J. and Watts, M.J. (editors): 1995: Geographies of Global Change: Remapping the World in the Late Twentieth Century, Blackwell, Oxford.
Mitchell, B. 1997: Resources and Environment Management, Addison Wesley Lon~an Ltd., Harlow. Pickering, K. and Owen, L.A. 1997: An Introduction to Global Environmental Issues, 2nd edition, Routledge, London.
Taaffe E.J. & H. L. Gauthier (1973) Geography of Transportation, Prentice-hall Inc.
United Nations Populations Fund 1997: India Towards Population and Development Goals, Oxford University Press, New Delhi.
Unwin, T. (editor) 1994: Atlas of World Development, John Wiley and Sons Ltd., Chichester.
World Bank 1996: From Plan to Market: World Development Report 1996, Oxford University Press, Oxford.
World Resources Institute 1998: World Resources 1998-99: A Guide to the Global Environment, Oxford University Press, Oxford

Course Title: Population Geography
Course Code: GCC -202

Time: 3 Hours **M.M. 80+20**

Unit I

Nature and Scope of Population Geography
Sources of Population Data: Census, Sample Survey, Vital Statistics, International Sources.
World Population Growth: Trends in Developing and Developed Countries
Environmental and Social factors of Population Distribution
Spatial Distribution pattern of Population in the 21st Century

Unit II

Population Composition and Characteristics in the Developed and Developing countries in context of the variables of: Age, Sex, Rural-Urban, Occupational Structure, Literacy and Education.

Unit III

Components of Population Change.
Fertility: Measurement Techniques, Social and Economic Theories, Global and Regional Trends.
Mortality: Measurement Techniques, Life Table, Global and Regional Trends.
Migration: Types, Streams, Ravenstein's Law, Theory of Intervening Opportunities, Gravity Model

Unit IV

Theories of Population Change: Malthusian, Neo-Malthusian,
Concept of Population Explosion
Concept of Optimum Population;
Demographic Transition Theory.

Unit V

Development and Environmental Conservation Dilemma.
Population Policies in Developed and Developing Countries.
Population Projection: Techniques and World Scenario.
Diaspora, and Identity Crisis.

Suggested Readings:

Asha A. Bhende, Tara Kanitkar (1978), Principles Of Population Studies, Himalaya Publishing House.
Jacob S. Siegel and David A. Swanson (2004), The Methods and Materials of Demography
K. Srinivasan (1998) 'Basic Demographic Techniques and Applications', New Delhi: SAGE India.
R.C. Chandna (1986), A Geography of Population, Kalyani Publishers.
Shryock, H.S. and J.S. Siegel (1971). The Methods and Materials in Demography (Vol. I and II), Washington DC, US Bureau of Census.

Agarwala and Sinha, 1977, India's Population Problems, Tata McGraw-Hill Publishing Co. Ltd., New Delhi
Bird, J., 1977: Centrality and Cities, Routledge, London
Borooah, G.L., 1938, Population Geography of Assam, Mitali Publications
Cassen, R.H., 1978, India: Population, Economy and Society, English language Book society and Macmillan
Chandna R.C. 2005: Population Geography, Kalyani publishers
Chitambar, J.B. 1993: Introductory Rural Sociology, Wiley Eastern, New Delhi
Clout, Hugh D., 1972, Rural Geography-An Introductory survey, Pergamon Press
Dickinson, R.E. 1968: City and Region: A Geographical Interpretation, Routledge and Kegam Paul Ltd. London.
Diddee, J., 1997: Indian Medium Towns, Rawat Publications, Jaipur.
Flint C and Flint.D, 1999: Urbanisation Changing Environments, Collins, London Garnier, J. Beaujeu, 1966, Geography of Population, Commonwealth Printing Press Ltd.
Ghosh, S. 1998: Introduction to Settlement Geography, Orient Longman Ltd., Calcutta
Hassan, M. Izhar, 2005, Population Geography, Rawat Publications
Herbert, David and Thomas, Colin, 1982: Urban Geography A First Approach,Jhon Wiley & Sons, New Delhi
Hudson, F.S. 1970: Geography of Settlements, Macdonald and Evans Ltd., PlymouthHusain,
Kuppuswany, B., 1975, Population and Society in India, Popular Prakashan, Bombay
Law.N,Smith.D,(1991),Decision Making Geography, Stanley Thornes Pub. Ltd, Leckhampton
Mandal, R.B. (2000): Urban Geography: A Textbook, Concept Pub. Co., New Delhi.
Mandal, R.B. 1988: Systems of Rural Settlements in Developing Counties, Concept Pub. Co., New Delhi
Mandal, R.B., Uyanga, J. and Prasad, H., 2007, Introductory Methods in Population Analysis, Concept Publishing Company

Course Title: Quantitative Methods in Geography
Course Code: GCC- 203

Time: 3 Hours **M.M. 80+20**

Unit I

Introduction: Data in Geography, Types of Data: Nominal, Ratio, Interval, Discrete, Continuous; Frequency Distribution; Concepts of population, sample; parameter, statistics.
Measures of Central Tendency: Arithmetic Mean, Mode, Median, (Discrete & Continuous Series

Unit II

Sampling: Definition, Types of Sampling Techniques, Its application in Geographical studies: Survey, Schedule, Questionnaire, Non-Probability Sampling.
Measurement of Dispersion: Mean Deviation, Standard Deviation, and variance.

Unit III

Correlation, Scatter Diagrams, Regression analysis, Indices of inequality (Lorenz Curve, Gini's Coefficient) and disparity. Time Series analysis.

Unit IV

Concept of Probability. Probability Distribution – Normal, Binomial and Poisson. Area under Normal Curve, Permutation and Combination. Standard Error of Mean; Confidence interval; Test of Significance.

Unit V

Hypothesis formulation – Null Hypothesis and Alternate Hypothesis.
Hypothesis testing: Student T Test, Z Test; Chi-Square, Mann-Whitney Test and Mann-Kendall Test. Pattern Analysis: Nearest Neighbour analysis;

Suggested Readings:

Alvi, Z. 1995: Statistical Geography: Methods and Applications, Rawat Pub. New Delhi.
Pal, S.K. 1999: Statistics for Geoscientists, Concept publishing Company, New Delhi Silk, J. 1979: Statistical techniques in Geography, George Allen and Unwin, London Ahuja, R. (2001). Research Methodology. Kolkata: Rawat Publication.
Das, D. L. (2000). Practice of Social Research. New Delhi: Rawat Publication. Harper, C., & Marcus, R. (2007). Research for Development: A practical Guide. New Delhi: Vistaar Publication.
Kothari, C. (2009). Research Methodology: Methods and Techniques. Kolkata: New Age International Publishers.
Misra, H., & Singh, V. (1998). Research Methodology in Geography: Social and Policy Dimension. New Delhi: Rawat Publication.
Misra, R. (2001). Research Methodology: A handbook. New Delhi: Concept Publishing Company.
Mondal
Panneerselvam, R. (2009). Research Methodology. Learning private limited. Singh, K. (2007). Quantitative Social Research Methods. New Delhi: Sage Publication.
Somekh, B., & Lewin, C. (2005). Research Methods in Social Science. New Delhi: Vistaar Publication.

Course Title: Environmental Geography
Course Code: GCC-204

Time: 3 Hours **M.M. 80+20**

Unit I

Environmental Geography: Concepts and Study of Ecological History. Approaches to Environmental Studies: Environmentalist, Holistic, Organismic and Human Ecological.
Environmental pollution- meaning, types, sources, causes and impacts; Air, Water and Land pollutions;

Unit-II

Ecosystem: Meaning and concepts of ecosystem, Classification and components of eco-system, Trophic structure, Ecological pyramid, Energy flow and Biogeochemical cycle; Global Ecological regions

Unit-III

Deforestation: causes and impacts. Biodiversity Degradation: Hot Spots and environmental impacts. Greenhouse effect and Global warming. Ozone depletion, causes of spatial-temporal variations in Ozone Hole formation over the Arctic and Antarctic regions.

Unit IV

Land Degradation and Desertification in different environmental regions.
Production Technology and Environmental Change, Technological Fix; Carbon Concentration and Sequestration; Red, Brown and Green Technology.

Unit V

Global Resource Scarcity with special reference to Food and Energy. Relationship between population increase and environmental degradation. Tragedy of the commons;
Environmental politics of Resource and Development with Special Reference to Climate Change, Earth Summits, and Protocols and concept of Sustainable Development.

Suggested Readings:

Adams, W.M. 1995: Green Development: Environmental Sustainability in the Third World, Rout1edge, London
Alexander, D. 1993: Natural Disasters, Research Press, New Delhi Allaby, M. 1996: Basics of Environmental Science, Routledge, and London Allaby, M. 2006: The Encyclopaedia of Natural Calamities, Viva, Kolkata.
Arnold, D. & Guha, R. 1995: Nature, Culture & Imperialism, OUP, New Delhi Barrow, C. J. (2003). Environmental Change and Human Development. Arnold Publication.
Bhattacharra, R.N. (Ed.) Reprint, 2007. Environmental Economics – An Indian Perspective, Oxford University Press, New Delhi.
Blaikie, P., Cannon, To Davis, I. and Wisener, 1994: At Risk: Natural Hazards, People's Vulnerability and Disasters, Routledge, London
Brown, J.H. & Lomolino, M.V. 1998: Biogeography, Sinauer Associates, USA.
Bryant, E.A. 1991: Natural Hazards, Cambridge University Press, And Cambridge.
Buchholz, R.A. 1993: Principles of Environmental Management, the Greening of Biosphere, Prentice Hall Inc., New Jersey
Canter, L. W. 1996: Environmental Impact Assessment, 2nd edition, McGraw Hill, New York.
Chambers, R., Saxena, N.C. & Shah, T. 1989; To the Hands of the Poor: Water and Trees, Oxford & IBH, New Delhi.
Chary, S. N. (2008). Environmental Studies. Macmillan Publication.
Cox, C.B & Moore, P.D. (2000) Biogeography - An Ecological & Evolutionary Approach, Blackwell Science Ltd, Oxford, London
Das, M.C. 1993: Fundamentals of Ecology, Tata Mc Graw Hill, New Delhi.
Echlom, E.P. 1991: Down To Earth, EWP, New Delhi.
Elsom, D.M. 1992: Atmospheric Pollution: A Global Problem, 2nd edition, Blackwell Pub. Co., London.
Farmer, A. 1997 : Managing Environmental Pollution, Routledge, London.

Gadgal, M. & Guha, R. 1993 ; This Fissured Land- An Ecological History of India, O U P, New Delhi.
Gilpin, A. 1996 : Dictionary of Environment and Sustainable Development, John Wiley and Sons Ltd., Chichester:
Gilpin, A. 1997 : Environmental Impact Assessment: Culling Edge for the Twentyfirst Century, Cambridge University Press, Cambridge: 181p.
Hugget, R. & Cheesman, I.(2002) Topography & The Environment, Prentice Hll, New York, London.
Huggett, R.J (Reprint 2002) Fundamentals of Biogeography, Routledge, London & New York.
Hynes, R. (1982). Environmental Science Methods. London: Chapman & Hall. I.G. Simmons – Ecology of Natural Resources, New York.
Johansen, B. E. (2006). Global Warming in the 21st Century. Atlantic Publication. Maiti, S. K. (2001). Handbook of Methods in Environmental Studies, Water and Waste Water Analysis. Jaipur: ABD Publishers.
Malhotra, R. (2008). Global Warming . Global Vision Public House.
Marsh, W.M. and Grossa, J.M. 1996: Environmental Geography: Science, Landuse and Earth Systems, John Wiley and Sons Inc., New York.
Mathur, M.H. & Marsden, D. 1998 : Development Projects and Impoverishment Risk, OUP, New Delhi.
Marsh, W.M. & Grossa(Ir). I.(1996) Environmental Geography- Science, Land use & Earth Systems, John Willey & Sons, New York
Manivasakam, N. 1984 ; Environnental Pollution, NBT, New Delhi.
Mackenzie, A., Ball, A.S. & Virdee, S.R. (Reprient 2001). Instant Notes in Ecology, Viva Books PrivateLtd. New Delhi, Mumbai & Chennai.
Middleton, N & Keefe, P.O (2001) Redefining Sustainable Development, Pluto Press, London, Sterling & Virginia.
Mishra, R. N. (2008). Environment and Forest Resource Management . New Delhi: Sonali Publication, .
Odum, E.P. 1971 : Fundamentals of Ecology, WB Saunders, USA
Park, C. 1998: The Environment: Principles and Applications, Routledge, London:43
Pickering, K. and Owen, L.A. 1997 : An Introduction to Global Environmental Issues, 2nd edition, Routledge, London:
R. Guha(Ed) 1994: Social Ecology, OUP, New Rajagopalam, R. (2005). Environmental Studies. Oxford University.
Roberts, N. (editor) 1994: The Changing Global Environment, 3rd edition, Blackwell Pub. Co., London.
Rosenbaurn, W.A. 1991: Environmental Politics & Policy, EWP
Sukla, R S. & Chandel, P.S. 1991: Plant Ecology, S.Chand & Co. Ltd., New Delhi. Speth, I.G. (Reprint 2005) Global Environmental Challenges – Transitions to a Sustainable World, Orient Longman, New Delhi.
Tivy, J & Hare, O.G.(1981) Human Impact On The Ecosystem, Oliver & Boyd, Edinburg & New York.
Turk, I. & Turk. A. (1988) Environmental Science, Saunders College Publishing, New York.
Ta'I, B., Murphy, P. & Rana, P.S. (Ed.2007) Environmental Impact Assessment, Indo-Australian Perspective, Bookwell, New Delhi.
New York.
Vogler, J. 1995: The Global Commons: A Regime Analysis, John Wiley and Sons Ltd., Chichester

Wathern, P. (editor) 1988: Environmental Impact Assessment: Theory and Practice, Routledge, London.
Whyte, I.L.1995: Climate Change and Human Society, Arnold, London.
Woodward, F.I. 1992: Global Climatic Change: The Ecological Consequences, Academic Press, London.

Course Title: Practical (Combined Practical for GCC-201 and GCC-202)
Course Code: GPC – 205

Distribution of marks:	**Marks**
1. Lab work/ Written work: 4 hrs duration	40
2. Record work & viva- voce: 1 hr duration	10 +5 =15
3. Field Visit & viva-voce: 1 hr duration	08 +2 =10
4. Field Survey & viva-voce: 2 hr duration	10 + 5= 15
5. Internal Evaluation	20
Total	100

Note: The candidate is required to answer/attend any 4 exercises (10 marks each) out of 6 exercises during Lab Work/ Written work and 20 candidates shall be examined in one batch.

General principles and classification of projections.

Mathematical construction, properties, limitations, and uses of Zenithal (Polar cases: Stereographic, Orthographic, Gnomonic, Equal Area), Conical (Simple conical projection with one standard parallel; Simple conical projection with two standard parallels; Bonne's projection, Polyconic projection); Cylindrical projections (Mercator, Gall's, Equal Area) and Conventional Projections (Mollweide and Sinusoidal).

Distortions related to different projections: distance; direction; area and scale variation.

Concept of UTM Projection and Conversion of Latitude and Longitude to UTM coordinates.

An environmental survey pertaining to local issues in nearby village/urban ward.

Surveying Instrument - Working Principal and Uses: Prismatic Compass.

Course Title: Practical (Combined Practical for GCC-203 and GCC-204)
Course Code: GPC – 206

Distribution of marks:	**Marks**
1. Lab work/ Written work: 4 hrs duration	40
2. Record work & viva- voce: 2 hr duration	10 +5 =15
3. Field Visit & viva-voce: 2 hr duration	20 +5 =25
4. Internal Evaluation	20
Total	100

Note: The candidate is required to answer/attend any 4 exercises (10 marks each) out of 6 exercises during Lab Work/ Written work and 20 candidates shall be examined in one batch.

Representation of Population Distribution Characteristics using diagrams and maps: Pyramid Diagram, Social structure (rural & urban population), Literacy rate, housing conditions. Occupational and age structures: divided rectangles and circles.
Natural increase, decadal population growth rate, Index of population change. Polygraph of birth and death rates. Principal component analysis. Lorenz curve.

Methods of Socio-Economic Surveying: Questionnaire; Interview; Focus Group Discussion; Participatory Observation. Difference between Schedule and Questionnaire.

Preparation of Survey Schedule/ Questionnaire: Household Survey, Market Survey, Tourist Survey, Socio-economic Survey etc.

Socio-Economic Survey: Collection of demographics and socio-economic data at household level (Duration one week) from primary and / or secondary sources and preparation of analytical survey report to assess the development of an area highlighting the socio-economic conditions, problems, and suggestions for the development.

Suggest Readings:

Kellaway, G. P. 1970: Map Projections, Methun and Co. Ltd., London.
Monkhouse F.J. and Wilkinson, H.R. 1971: Maps and Diagrams: Their Compilation and Construction, B.I. Publications Private Limited, New Delhi.
Maceachren, A. M. and Taylor, D. R. F. 1994: Visualization in Modern Cartography, Permamon. UK.
Dorling, D. and Fairbirn, D. 1997: Mapping Ways of Representing the World, Longman. England.

M.A./M.Sc. Semester III

GFC-300	Basic Communication Skills or Basic Computer Course or Seminar + Academic Writing
GCC-301	Geo-spatial Techniques
GCC-302	Geography of India
GCE-303	A. Geography of Eurasia or B. Geography of North and South America
GEO-304	A. Agriculture Geography or B. Geography of Health
GPC-305	Practical (Combined Practical for GCC - 301 and GCC-302)
GPC-306	Practical (Combined Practical for GCE -303 and GEO-304)

Course Title: Geo-spatial Techniques
Course Code: GCC 301

Time: 3 Hours **M.M. 80+20**

Unit I

Fundamentals of Remote Sensing, EMR, Types of Bands, Resolution, Sensor, FCC, Characteristics of LANDSAT, LISS, SENTINAL, SRTM, MODIS, IKONOS, ASTER data sets.

Unit II

Digital image processing techniques: contrast enhancement, band rationing, spatial filtering, PCA, Vegetation Indices, Visual Image Interpretation, Unsupervised & Supervised Image Classification

Unit III

Fundamentals of GIS, Import of spatial data, Geo-Referencing of analogue Maps & Images Spatial data forms, representation of spatial data in GIS environment
Linking of attribute data to spatial objects; spatial queries, working with Buffer, spatial analysis

Unit IV

Mapping and assessment of dynamic earth surface and change detection at: (a) seasonally changing agricultural fields; (b) year to year variations in snow cover, inland water bodies, rainfall distribution (c) long term changes in forest cover and urban expansion.

Unit V

Application of Remote sensing and GIS in Flood Hazard mapping and mitigation;
Flood Hazard mapping and mitigation, Landslide Hazard mapping and mitigation, Earthquake Hazard mapping and mitigation, Cyclone Hazard mapping and mitigation, Management of Surface water Resources, Management of Forests and Wild life resources

Suggested Readings:

Avery, T.E., and G.L. Berlin. Fundamentals of Remote Sensing and Air photo Interpretation, Macmillan, New York.1992.
Campbell, J.B. Introduction to Remote Sensing, Guilford, New York.1996.
Curran, Paul J. Principles of Remote Sensing, Longman, London & New York. 1985.
Joseph, G. Fundamentals of Remote Sensing, Universities Press Hyderabad. 2005.
Lillisand, T.M. and P. W. Kiefer. Remote Sensing and Image Interpretation, New York. John Wiley & Sons.1986.
Burrough, P.A. and McDonnell, R.A. Principles of Geographic Information System. Oxford: Oxford University Press. 1998.
Chang, Kang-tsung. Introduction to Geographic Information Systems. New Delhi: Tata McGraw-Hill.2006.
Doberstein, Dan. Fundamentals of GPS Receivers: A Hardware Approach. New York: Springer

Course Title: Geography of India
Course Code: GCC- 302

Time: 3 Hours **M.M. 80+20**

Unit I

Topography, Geology, Climate, Drainage, Natural Vegetation, Soils.

Unit II

Distribution and use of minerals, fossil fuel resources, hydro power and renewable energy resources: Solar and Wind Energy.

Unit III

Distribution of major Agricultural crops: wheat, rice, tea, coffee, sugarcane, millets, pulses, cotton
Distribution and factors of localization of major industries: Iron and Steel, Aluminum, Cement, Petrochemical Refining, Chemicals.

Unit IV

Population distribution, density and growth, population problems and policies. Economic activities, Urbanization.

Unit IV

Contemporary geographical issues: spatial variations in levels of regional development, impact of globalization; environmental degradation, impact of demographic transition

Suggested Readings:

Agarwal,A.N.1995:Indian Economy ,Problems of Development and Planning,Vishwa Prakasan ,New Delhi
Misra,S.K,and Puri,V.K. 1997: Indian Economy,Himalaya Publishing House, Mumbai
Adams, W.M. 1995: Green Development: Environmental Sustainability in the Third World, Rout1edge, London.
Dasgupta P, 1996: An enquiry into Wellbeing and distribution. Clarendon Press oxford
Gerald M. & Roucc J 2003: Leading Issues in Economic Development, OUP
Powar.M 2003: Rethinking Development Geographies, OUP
Chandra R.G., Tribal development in India : the contemporary debate, Sage New Delhi
Smith. K, Environmental hazards : assessing risk and reducing disaster, Routledge London
Desai Vasant, Forest management in India-issues and problems, Himalaya Publishing House Bombay
Swaminathan S(2007) : Agriculture cannot wait,Academic Foundation, New Delhi
Sharma .T.C.& Coutinho .O. (1989): Green revolution gaps,Rawat.

Course Title: Geography of Eurasia

Course Code: GCE 303 (A)

Time: 3 Hours **M.M. 80+20**

Unit I

Asia: landforms, climate, vegetation, soils.

Unit -II

Asia: population distribution, recourse use and economic activities, urbanization.

Unit III

Europe: landforms, climate, vegetation, soils.

Unit IV

Europe: population distribution, recourse use and economic activities, urbanization.

Unit V

Contemporary geographical issues: spatial variations in levels of development, impact of globalization; environmental degradation, impact of demographic transition

Suggested Readings:

De Blij, H.J. and Muller, P.O. 1997: Geography: Realms Regions and Concepts, 8th edition, John Wiley and Sons Ltd., New York.
Xu, H. J., Wang, X. P., & Yang, T. B. (2017). Trend shifts in satellite-derived vegetation growth in Central Eurasia, 1982–2013. Science of the Total Environment, 579, 1658-1674.
Chytrý, K., Willner, W., Chytrý, M., Divíšek, J., & Dullinger, S. (2022). Central European forest–steppe: An ecosystem shaped by climate, topography and disturbances. Journal of Biogeography, 49(6), 1006-1020.
Srymbetov, T., Jetybayeva, A., Dikhanbayeva, D., & Rojas-Solórzano, L. (2023, February). Mapping non-conventional atmospheric drinking-water harvesting opportunities in Central

Eurasia: The case of Kazakhstan. In Natural Resources Forum (Vol. 47, No. 1, pp. 87-113). Oxford, UK: Blackwell Publishing Ltd.
J. Biersack, and S. O'Lear, "The Geopolitics of Russia's Annexation of Crimea: Narratives, Identity, Silences, and Energy," Eurasian Geography and Economics 55, no. 3 (May 2014): 247-69.
G. Ioffe and Z. Zayonchkovskaya, "Immigration to Russia: Inevitability and Prospective Inflows," Eurasian Geography and Economics 51, no. 1 (Jan-Feb 2010): 104-25.

Course Title: Geography of North and South America

Course Code: GCE 303 (B)

Time: 3 Hours **M.M. 80+20**

Unit I

North America: landforms, climate, vegetation, soils,

Unit II

North America: population distribution, recourse use and economic activities, urbanization

Unit III

South America: landforms, climate, vegetation, soils,

Unit IV

South America: population distribution, recourse use and economic activities, urbanization

Unit V

Contemporary geographical issues: spatial variations in levels of development, impact of globalization; environmental degradation, impact of demographic transition

Suggested Readings:

De Blij, H.J. and Muller, P.O. 1997: Geography: Realms Regions and Concepts, 8th edition, John Wiley and Sons Ltd., New York.
Hardwick, Susan W., Fred M. Shelley, and Donald G. Holtgrieve. 2013. The Geography of North America: Environment, Culture, Economy. 2nd edition: Pearson, Boston, MA.
Woodard, Colin. 2011. American Nations: A History of the Eleven Rival Regional Cultures of North America.: Penguin Books, New York.
Birdsall et al., 2009. Regional Landscapes of the United States and Canada 7th Edition.: John Wiley and Sons, New York.

Course Title: Agriculture Geography
Course Code: GEO 304 (A)

Time: 3 Hours **M.M. 80+20**

Unit I

Elements of agricultural Geography. Factors affecting agriculture: Physical- relief, climate, soil, water, storage etc. social land ownership and size of holding; Economic input of human and animal power, irrigation, fertilizers, mechanization; financial management, market system, transport, and trade etc.

Unit-II

Types of agriculture, Whittlesey's classification of agricultural regions, Special study of plantation agriculture, Mediterranean, intensive agriculture, dry farming, and their characteristics.

Unit-III

Models in agricultural land use: concept, need and principles; Von Thuenen's Agricultural Location Theory and its recent modification. Measurement of levels of agricultural development: concept and methodology.

Unit IV

Agricultural regionalization, methods of delimitation; Crop ranking, crop combination regions, Detailed study of Kendal, Weaver, Doi and Raffiullah; Cropping intensity and crop diversification; agricultural efficiency.

Unit V

Applied Agriculture Geography: Land classification- need and basis of classification British, American, Indian, Irish patterns, Land use data- sources, types of mapping and problems.

Suggested Readings:

Ali Mohammed : Dynamics of Agriculture Development in India , Concept, New Delhi. Gregor, H P : Geography of Agriculture, Prentice Hall, New York, 1970.
Grigg, D B : The Agriculture System of the World, CambridgeUniversity Press, New York, 1974.
Hartshorne, T A & Alexander, J W : Economic Geography, Prentice Hall, New Delhi, 2000.
I.C.A.R.: Soil and Water Conservation Research, (1956- 71).
I.C.A.R : Soil Conservation in India.
Kostrowicki, J : World Types of Agriculture, PolishAcademy, Warsaw, 1976.
Morgan, W B &Nortan, R J C : Agriculture Geography, Mathuen, London, 1971.
Noor Mohammed: Agricultural Land use in India, Inter-India, Delhi. 16
Sachidanand: Social Dimensions of Agricultural Development, National Publishing House, Delhi.
Shafi, M : Land Utilization in Western UP, AMU Aligarh, 1960.
Singh &Dhillon : Agricultural Geography, Tata, McGraw Hill, New Delhi, 1988.
Stamp, L D : The Land of Britain, its use and miss-use, Longman, London, 1962. Symon Leslie : Agricultural Geography, Bell & Sons, London, 1967.
Pramila Kumar: KrishiBhoogol, M P HindiAcademy.
BrijBhushan Singh: KrishiBhoogol, Gorakhpur.
B. L. Sharma: KrishiBhoogol, Himanshu, Udaipur, 2003.

Course Title: Geography of Health
Course Code: GEO 304 (B)

Time: 3 Hours **M.M. 80+20**

Unit I

Nature, scope and significance of Geography of Health; its development and distinction from Medical Science. Physical factors affecting human health and diseases- Topography/Relief, Climate: Temperature and Humidity, Groundwater Quality, Soils, Vegetation

Unit II

Social Factors (Population Density, Literacy, Social Customs, Poverty), Economic Factors (Food and Nutrition, Occupation, Standard of Living), Environmental Factors (Urbanization and Congestion; Water, Air and Noise Pollution, Solid Waste).

Unit III

Classification of Diseases- Genetic, Communicable and Non-Communicable; Occupational and Deficiency Diseases. WHO classification of diseases; Deficiency disorders and problems of Malnutrition in India.

Unit IV

Pattern of World distribution of major diseases; Ecology, Etiology and Transmission of major diseases: Cholera, Malaria, Tuberculosis, Hepatitis, Cardiovascular, Cancer, AIDS and SARS – CoV (Corona).

Unit V

Health Care Planning and Policies- Availability, Accessibility and Utilization of Health Care Services; Inequalities in Health care Services in India; Family Welfare, Immunization, National Disease Eradication, and Health for All programmes.

Suggested Readings:

Aikat, B.K. (1985): Tropical diseases in India, Arnold Meinemann, Delhi, 1st Edition

Akhtar Rais (1990): Environmental population and health problems, Ashish Publishers Home, New Delhi.

Ansari, S.H. (2005): "Spatial Organization of health care facilities in Haryana" NGJI, Vol 51, PP 3-4, 51- 61.

Chakrabarti, N. (1954): "Some factors influencing the mortality of cholera. Calcutta," Medical Journal, Vol. 51.

Determinants of Health (1995): A New Synthesis. John Frank. Current Issues inPublic Health, 1:233240.

Egles, J. and Woods, K.J. (1983): The Social Geography of Medicine and Health, Groom Helm London, 1st addition.

K. Chaubey, "Epidemic of HIV/AIDS in India: A Study in Medical Geography. "Annals of NAGI, Vol. XXV No.1, 2005 pp 28-33.

Learmonth, A.T.A. (1985): Diseases in India, Concept Pub. Company, New Delhi,1st Edition.

Misra, R.P., (2007): Geography of Health, Concept Publishing Company, New Delhi,

Robert G. Evans, Morris Barer, and Theodore Marmor. (1994): "Why are Some People Healthy and Others Not? The Determinants of the Health of Populations". Aldine Transaction, USA.
Shafi, M. (1967): "Food Production, efficiency and Nutrition in India." The Geographer, Vol. pp. 23-27.
Siddiqui, M.F. (1971): "Concentration of Deficiency Diseases in Uttar Pradesh. The Geographer, Vol. 18 Pp 90-98.
Singhai, G.C. (2006): Medical Geography, Vasundhra Publication, Gorakhpur, 2006. Wilkinson R G. (1996): "Unhealthy Societies: The Afflictions of Inequality", Routledge, London

Course Title: Practical (Combined Practical for GCC-301 and GCC-302)
Course Code: GPC – 305

Distribution of marks:	**Marks**
1. Lab work/ Written work: 4 hrs duration	40
2. Record work & viva- voce: 1 hr duration	10 +5 =15
3. Field Visit & viva-voce: 1 hr duration	08 +2 =10
4. Field Survey & viva-voce: 2 hr duration	10 + 5= 15
5. Internal Evaluation	20
Total	100

Note: The candidate is required to answer/attend any 4 exercises (10 marks each) out of 6 exercises during Lab Work/ Written work and 20 candidates shall be examined in one batch.

Aerial Photographs: Types, Edge Information, Elements of Air photo Interpretation. Preparation of thematic overlays and feature identification. Scale, Parallax and extraction of relative height of geomorphic features from Aerial photo pairs. Stereoscopy.

Remote Sensing: Elements of Image Interpretation. Common types of IRS and Landsat sensors and their suitability for analysis of geographical information. Extraction of physical features from satellite images of various resolution and band combinations. Extraction of cultural features from satellite images of various resolution and band combinations. Change detection from multi dated images.

Geographical Information System: Digital Image processing, Spatial analysis through vector overlay. Preparation of annotated thematic maps. Preparation of DEM from spot heights, contours and SRTM data.

Global Navigation Satellite System: Principles of GNSS positioning with special reference to GPS. Collection and retrieval of GNSS positions.

A one-day field visit will be conducted for GNSS survey and location mapping to demonstrate the use of GNSS technology in spatial data collection. A report based on the activity is to be submitted by each student.

Surveying Instrument - Working Principal and Uses: GPS/ GNSS.

Course Title: Practical (Combined Practical for GCE-303 and GOE-304)
Course Code: GPC – 306

Distribution of marks:	**Marks**
1. Lab work/ Written work: 4 hrs duration	40
2. Record work & viva- voce: 1 hr duration	10 +5 =15
3. Field Visit & viva-voce: 1 hr duration	08 +2 =10
4. Field Survey & viva-voce: 2 hr duration	10 + 5= 15
5. Internal Evaluation	20
Total	100

Note: The candidate is required to answer/attend any 4 exercises (10 marks each) out of 6 exercises during Lab Work/ Written work and 20 candidates shall be examined in one batch.

Distribution maps: qualitative and quantitative.
Representation of geographical data using diagrams: Divided rectangles and circles for land use and crop pattern;
Choropleth for: industrial workers per square km.; length of roads per square km; number of buses per day
Statistical Methods in Geography- Kendall's Ranking Method, Weaver crop combination method.
Chorochromatic map, Isochrones maps.
Cartograms: equal cost distance cartograms, value area cartograms, traffic flow cartograms.
Annual water deficiency and surplus graph.
Trilinear Chart. Semi log and log graph
Agricultural or Health survey in the local area and preparation of report.

Surveying Instrument - Working Principal and Uses: Indian Clinometer, Abney Level.

Suggested Readings:

Barry Kavanagh and Frank W. G. T. Bailey "Surveying for Construction"
Charles D. Ghilani and Paul R. Wolf "Elementary Surveying: An Introduction to Geomatics" Basak N. N. "Surveying and Levelling"
Charles L. Cheetham "Introduction to Geodetic Surveying"
Chauhan, P. R. "Practical Geography" Wasundhara Prakasan Gorakhpur.
David M. Clark "Engineering Surveying"
Dickinson, G.C.: Statistical mapping of statistics, London
Dorling, D. and Fairbirn, D. 1997: Mapping Ways of Representing the World, Longman. England.
Kanetkar, T.P. "and Kalkarni, S.V. Surveying and Leveling" part 1, Page 355
Kellaway, G. P. 1970: Map Projections, Methun and Co. Ltd., London.
Khan, Z A: Text book of Practical Geography, Concept, New Delhi, 1998.
Lawrence, GRP: Cartographic Methods, London, 1971.
Maceachren, A. M. and Taylor, D. R. F. 1994: Visualization in Modern Cartography, Permamon. UK.
Monkhouse F.J. and Wilkinson, H.R. 1971: Maps and Diagrams: Their Compilation and Construction, B.I. Publications Private Limited, New Delhi.

Monkhouse, FJ & Wilkinson HR: Map & Diagram, Methuen, London, 1994.
Robinson AH et,al. : Elements of Geography, John Willey, New York, 1995.
Sarkar, A K: Practical Geography: A Systematic Approach, Oriental Longman, Calcutta, 1997.
Saroj K. Pal: statistics for Geosciences- Techniques and applications, Concept, New Delhi, 1998.
Singh LR. & Singh R. Mapwork and Practical Geog. p. 154

M.A./M.Sc. Semester IV

GFC-400	Environmental Health and Hygiene
GCC-401	Settlement Geography
GCC-402	Political Geography
GCE-403	A. Social and Cultural Geography or B. Industrial Geography
GEO-404	A. Geography of Rajasthan or B. Regional Planning and Development
GPC-405	Practical (Combined Practical for GCC-401 and GCC-402)
GPC-406	Practical (Combined Practical for GCE-403 and GEO-404)
GCE-407	Dissertation

Course Title: Settlement Geography
Course Code: GCC 401

Time: 3 Hours **M.M. 80+20**

Unit I

Definition, scope, and development of settlement geography. Settlement types, their characteristics, and differences. Factors influencing origin, growth, and distribution of settlements.

Unit-II

Theories in settlement geography. Morphological characteristics of rural and urban settlements with special reference to India. Classification of settlements based on population, patterns, spacing and functions.

Unit-III

Aspects of urban places: location, site, and situation - definition, nature, and significance. Theories of Urban Evolution and Growth. Stages of Urban Development: Urbanization, Suburbanization, Counter Urbanization and Re-urbanization. Morphology of urban settlements.

Unit-IV

Hierarchy of settlements: Christaller's Central Place theory, Losch's theory of market centres, Zipf's Rank Size Rule, Concept of Primate city - their applications in India; the Urban Fringe. Problems of Urbanization. Smart city: Concept, need and implementation in India.

Unit – V

Rural Settlements- Definition, Nature & Characteristics of Rural Settlements; Morphology of Rural Settlements- Site, Situation & Types; Layout- Internal and External; Rural House types & Building Material with respect to India.

Suggested Readings:

Ghosh. S. (2015): "Introduction to Settlement Geography", Orient Blackswan Private Limited, Hyderabad
Jyptirmoy Sen (2007): A Textbook of Social and Cultural Geography," Kalyani Publsiher, New Delhi.
Bhattacharya, B. (2006). Urban Development in India. New Delhi: Concept Publishing Company
Bird, James 1977: Centrality and Cities. Routledge, London
Cadwallader, M. (1985). Analytical Urban Geography. London: Prentice Hall.
Carter, H. 1981: Urban Geography, 3rd edition Arnold-Heinemann, New Delhi.
Das, A. K. (2007). Urban Planning in India. Jaipur: Rawat Publications.
Dave, M. (1991). Urban Ecology and Levels of Development. Jaipur: Rawat Publications
Dickinson, R.E. 1968: City and Region: A Geographical Interpretation.
Routledge and Kegam Paul Ltd. London.
Diddee, Jaymala 1997: Indian Medium Towns. Rawat Publications, Jaipur.
Flint C and Flint.D(1999):Urbanisation Changing Environments. Collins, London
Ghosh, S. 1998: Introduction to Settlement Geography. Orient Longman Ltd., Calcutta
Gibbs.J(1961) : Urban Research Methods.East-West Press Pvt Ltd. New Delhi
Glasson,J.(1975): An Introduction to Regional Planning. Hutchinson and Co.,London
Gottdiener, M., & Budd, L. Key Concepts in Urban Studies. New Delhi: Sage Publications .
Hardoy, J. E., Mittin, D. & Satterthwaite, D. 1992 : Environmental Problems in the World Cities. Earthscan Pub. Ltd. London.
Hudson, F.S. 1970: Geography of Settlements, Macdonald and Evans Ltd. PlymouthHerbert, David and
Thomas, Colin, 1982: Urban Geography A First Approach,Jhon Wiley & Sons. New Delhi
Johnston .R.J (2000): The Dictionary of Human Geography.Blackwell. UK
Kaplan.D and Wheeler.J (2008):Urban Geography.John Wiley
Knox, P. 1982: Urban Social Geography. Longman Scientific and Technical, Harlow.
Law.N,Smith.D,(1991),Decision Making Geography. Stanley Thornes Pub. Ltd, Leckhampton
Markandey, K., & Simhadri, S. (2009). Urban Environment and Geoinformatics. Jaipur: Rawat Publication.
Mcdonnell, M. J., Halns, A. K., & Breste, J. H. (2009). Ecology of Cities and Towns. Cambridge University Press.
Misra. H. N. (ed) 1987: Contributions to Indian Geography. Volume 9: Rural Geography, Heritage Pub., New Delhi.
Mohan Sudha 2005: Urban Development and New Localism. Rawat Publications,
Jaipur.
Pacione, Micheal, 2001: Urban Geography, Routledge, London
Naqvi, H. K. (1971). Urbanisation and Urban Centres under the Great Mughals.
Shimla: Indian Institute of Advance Studies.
Ramachandran R. 1989: Urbanisation arid Urban Systems in India. Oxford University Press, New Delhi.

Course Title: Political Geography
Course Code: GCC - 402

Time: 3 Hours **M.M. 80+20**

Unit I

Nature, Scope and recent developments in Political Geography; Approaches to Study; Major Schools of Thought; Classical Geopolitics and Critical Geopolitics;

Unit -II

Geographic Elements and the State (Physical, Human and Economic); State, Nation, Nation-State and Nation Building; Forms of Governance- Federal, Unitary; Frontiers and Boundaries.

Unit III

Colonialism, Decolonization, Neocolonialism; Geopolitical World Order- Origin and Cessation of Cold War; Global Strategic Views; Globalisation and the crisis of the Territorial State.

Unit IV

Geopolitical significance of Indian Ocean; Political Geography of West Asia.

Political Geography of contemporary India- Unity and Diversity: Centripetal & Centrifugal Forces; Sino-Indian Border Dispute; Kashmir Problem; Insurgency in Border States; Federalism in India; Inter-State Water Disputes (Special Reference to Sutlej Waters)

Unit V

Electoral Geography; Locality; Gerrymandering; Trends in Federal and State Elections in India Since 1990

Suggested Readings:

Agnew, John (1997) Political Geography: A Reader, Arnold, London
Adhikari, Sudeepta (2002) Political Geography, Rawat Publications, New Delhi
Pounds, Norman J.G. (1963) Political Geography, Mc Graw Hill Book Company
Husain Majid (1994) Political Geography, Anmol Publications Pvt. Ltd.
Cox, Kevin R. (2002) Political Geography: Territory, State, and Society, Blackwell Publishers, Oxford.

Course Title: Social and Cultural Geography
Course Code: Paper GCE 403 (A)

Time: 3 Hours **M.M. 80+20**

Unit-I

The Nature Meaning & Scope of Cultural Geography. Approaches in cultural geography. The contribution of Otto Schluter and Carl Sauer. Cultural Areas & Cultural Realm. Environment and Culture. Man as modifier of the earth

Unit-II

The Nature Meaning & Scope of Social Geography. Social Geography in the realm of Social Sciences. Theories of Social Formation and Transformation: Functional Theory (T. Parsons); Conflict Theory (Marx); Critical Theory (Adorno)

Unit III

Classification and distribution of Religious and linguistic groups in India. Concept, spatial distribution and problems of Scheduled Caste and Scheduled Tribe Groups in India.

Unit-IV

Folk Culture: Crisis and Transformation; Assimilation of Culture Cultural Globalization and Segregation: Space and Power

Unit V

Social Transformation and Change in India: Modernization and Sanskritization; Role of Rural – Urban Interaction; Problems of Social Transformation

Suggested Readings

Ahmad, Aijazuddin. 1999. Social Geography. Rawat Publication, New Delhi.

Anderson, Jon: Understanding Cultural Geography Places and Traces, London: Routledge, 2010.

Anderson, K. Domosh, M., Pile, S. & Thrift, N. (eds.): Handbook of Cultural Geography, London: Sage Publications, 2003.

Anderson, K. & Gale, F. (eds.): Cultural Geographies, 2 nd edition, Melbourne: Longman 1999.

Appadurai, A.: Modernity at Large: Cultural Dimensions of Globalisation, University of Minnesota Press, Minneapolis, 1996.

Bertolas, R. J.(1998): Cross-cultural environmental perception of wilderness. Professional Geographer, 50(1), pp 98-111.

Cosgrove, D. & Jackson, P. (1987): New directions in cultural geography. Area, 19(2), pp 95-101

Norton, W. and Walton-Roberts, M.: Cultural Geography: Environments, Landscapes, Identities, Inequalities. Ontario: Oxford University Press, 2014.

Price, M. & Lewis, M. (1993): The reinvention of cultural geography. Annals of the Association of American Geographers, 83 (1), pp1-17.

Shurmer-Smith, P (ed.). Doing Cultural Geography, Sage, New Delhi, 2003.

Casino Jr., V.D.: Social Geography: A Critical Introduction, John Wiley & Sons, London, 2009.

Jones, E. and J. Eyles: An Introduction to Social Geography, Oxford Univ. Press, London, 1977.

Jones, Emrys (ed.): Readings in Social Geography, Oxford University Press, London, 1975.

Khare, R.S.: Cultural Diversity and Social Discontent, Sage India, New Delhi, Sage India, 1998.

Rao, M.S.A.: Urbanisation and Social Change, Orient Longmans, New Delhi, 1970.

Sareen, T.R. and S.R. (ed.): Castes and Tribes of India, Anmol, New Delhi, 1993.

Singer, M. and B.S. Cohn (ed.): Structure and Change in Indian Society, Aldine, Chicago, 1968.

Singh, K.S.: Tribal Situation in India, Indian Institute of Advanced Studies, Shimla, 1972

Course Title: Industrial Geography
Course Code: GCE 403 (B)

Time: 3 Hours **M.M. 80+20**

Unit I

Nature and scope of Industrial Geography. Methods of measuring the spatial distribution of manufacturing industries; Location, quotient, coefficient of geographic association, Index of concentration.

Unit-II

Theories and models of industrial location: The least coast school, the transport coast school, the market area school, the marginal location school, the behavioral school.

Unit-III

Distribution, recent trends, problems, and prospects: Iron & steel industry, Aluminium industry, cotton textile industry, automobile, pulp & paper, cement industry and petro chemical industry.

Unit IV

Important industrial regions of the world. Case study of the following regions: (i) The Ruhr basin industrial region. (ii) The Great Lakes industrial region. (iii) The Guangdong industrial region (iv) The Mumbai Pune industrial region. (v) The Chotanagpur industrial region. (v) Industrial centres of Rajasthan: Bhiwadi, Bhilwara, Jaipur.

Unit V

New trends in industrial geography. Industrial hazards, and occupational health; Impact of manufacturing industries on economic development; Role of globalization on manufacturing sector.

Suggested Readings:

Alexanderson, C: Geography of Manufacturing, Prentice Hall Bombay, 1967.
Chauhan, M L &Khandelwal, M K: Dyeing, Printing and Textile, Ritu Publication, Jaipur, 2005.
Choudhary, M R: Industrial Geography of India. 4. Estall, R C & Buchanan, R O: Industrial Activity and Economic Geography, Hutchinson & Co. London.
Hartshorne, T A & Alexander, J W: Economic Geography, Prentice Hall, New Delhi, 2000.
Hoover, E M: The Location of Economic Activity, McGraw Hill, New York.
Isard, W: Methods of Regional Analysis, Techno. Press of MIT & John Willey, New York, 1956.
Lloyed, Peter E &Dicken, P: Location in Space: A Theoretical Approach to Economic Geography, Harper & Row, New York, 1972.
Miller, E : A Geography of Manufacturing, Prentice Hall, Englewood Cliffs, New Jersey, 1962.
Riley, R.C. Industrial Geography, Chatto and Windus, London, 1973.

Course Title: Geography of Rajasthan
Course Code: GEO 404 (A)

Time: 3 Hours **M.M. 80+20**

Unit I

Landforms, Geology, Climate, Drainage, Natural Vegetation, Soils

Unit II

Distribution and use of minerals, fossil fuel resources, hydro power and renewable energy resources,

Unit III

Spatial variations in Distribution of: agricultural crops, industries, population, economic activities, and urbanization

Unit IV

Contemporary geographical issues: spatial variations in levels of regional development, impact of globalization; environmental degradation, impact of demographic transition

Unit V

Assessment of Regional and Urban Development Initiatives in Rajasthan: Indira Gandhi Nahar Pariyojana; Chambal Project; Aravalli Hill Development Project; Urban Development: Jaipur Development Authority and Bikaner Development Authority

Suggested Readings:

Despande C. D. (1992): India-A Regional Inter-Pretation ICSSR, Northern Book Centre, New Delhi.

Singh R. L.(ed.) (1971): India-A Regional Geography, National Geographical Society, India, Varanasi.

Kundu A., Raza Moonis (1982): Indian Economy: The Regional Dimension, Spectrum Publishers, New Delhi.

Mamoria, C. B.: Advanced Geography of India.

Course Title: Regional Planning and Development
Course Code: GEO 404 (B)

Time: 3 Hours **M.M. 80+20**

Unit I

Regional Concept in Geography; Changing concept of Region; Merits and Limitations for application of regional concept to Regional Planning and Development; Concept and Need of Regional Planning.

Unit II

Types of Regions in the context of Planning; Regional Hierarchy; Special Purpose Regions- Metropolitan Regions, River Valley Regions; Problem Regions- Hilly Regions, Regions of Drought and Floods, Tribal Regions.

Unit III

Planning Process- Sectoral, Temporal and Spatial Dimensions; Short-Term and Long-Term perspectives of Planning. Concepts of Growth and Development; Indicators of Development and their Data Sources; Measuring Levels of Regional Development and Disparities- case study of India;

Unit IV

Case studies for Plans of Developed and Developing countries; Regional Development Strategies- Concentration (Perroux, North, Myrdal, Hirschman, Friedmann) vs Dispersal (Agropolitan, Basic Needs, Export-Led, Import Substitution).

Unit V

Regional Plans of India; Concept of Multi-Level Planning: its need and characteristics in India; Decentralized Planning in India; Peoples' Participation in the Planning Process; Administrative Structure and role of Panchayati Raj; Regional Development in India- Problems and Prospects.

Suggested Readings:

Agarwal, A.N. (1995): Indian Economy, Problems of Development and Planning, Vishwa Prakasan, New Delhi.

Blij, H. j. (1971). Geography Region and Concept. New York: Jhon and Wilay. Boudeville,J.R.(1966): Problems of Regional Economic Planning, Edinburgh University Press, Edinburgh.

Chand.M, Puri.V.K, (1983): Regional Planning in India, Allied Publishers, New Delhi.

Chandrasekhara, C.S. and Sundaram. K.V (1968): Metropolitan Centres and Regions in India, 21st International Geographical Congress, Metropolitan Growth and Planning.

Chatterjee, B., & Sur, H. (1998). Regional Dimensions of the Indian Economy.

Calcutta: Allied Publishers limited.

Das, A. K. (2007). Urban Planning in India. New Delhi: Rawat Publication. Dickinson.R.E, (1964): City, Region and Regionalism, A geographical Contribution to Human ecology Kegan Paul Ltd., London. utta,R. & K.P.M, Sundaram,(1997): Indian Economy, S.Chand and Cc.Ltd, New Delhi.

Freeman, T. (1974). Geography and Planning. London: Hutchinson University Library.

Gill,R.(1975):Economic Development :Past and Present, Prentice-Hall of India,New Delhi.

Glasson,J.(1975): An Introduction to Regional Planning, Hutchinson and Co.,London. Gottman, J., & Harper, R. A. (1967). Metropolis on The Move. New York: John Willy & Sons.

Hall, P. (1974). Urban and Regional Planning. New Zealand: Penguin Books.

Hall, P. (2002). Urban and Regional Planning. New York: Rouledge.

Husain, M. (1994). Regional Geography. New Delhi: Anmol Publication Pvt.Ltd. Jhonston, R., Haver, J., & Hoekveid, G. (1990). Regional Geography:Current Developments and Future Prospects. London and New York: Routledge Publishers.

Mandal, R. (1990). Patterns of Regional Geography :An InternationalPerspectives. New Delhi: Concept Publishing Company.

Mathew, G. (1986). Panchayati Raj in Karnataka Today:its National Dimention. New Delhi: Concept Publishing company.

Misra, R.P(1969): Regional Planning: Concepts, Techniques, Policies and Case Studies, Concept, New Delhi.

Misra. R.P,Sundaram.K.V & VLS Prakash Rao (1974): Regional Development Planning In India, A New Strategy, Vikas Publishing House Pvt.Ltd., New Delhi. Misra, S.K, and Puri, V.K.(1997): Indian Economy, Himalaya Publishing House, Mumbai.

Mitra, A. (1965): Levels of Regional Development in India, Government of India

Course Title: Practical (Combined Practical for GCC-401 and GCC-402)
Course Code: GPC – 405

Distribution of marks:	**Marks**
1. Lab work/ Written work: 4 hrs duration	40
2. Record work & viva- voce: 1 hr duration	10 +5 =15
3. Field Visit & viva-voce: 1 hr duration	08 +2 =10
4. Field Survey & viva-voce: 2 hr duration	10 + 5= 15
5. Internal Evaluation	20
Total	100

Note: The candidate is required to answer/attempt any 4 exercises (10 marks each) out of 6 exercises during Lab Work/ Written work and 20 candidates shall be examined in one batch.

Population potential surface map. Scatter diagram. Nearest Neighbour Analysis of settlement distribution. Calculation of Human development index, Poverty index, Gender related development index.
Measures of Urbanization: Choropleth map of Degree of urbanization; Choropleth map of Urban-Rural ratio; Graphical Representation of Tempo of Urbanization.
Transport network indices.
Preparation of Thematic maps using conventional and GIS tools.
Centrality measures of settlements. Econograph (star diagram of controls of settlement)

Housing survey or Industrial field visit in the local area and preparation of report.

Surveying Instrument - Working Principal and Uses: Dumpy level/ Automatic level

Course Title: Practical (Combined Practical for GCE-403 and GOE-404)
Course Code: GPC – 406

Distribution of marks:	**Marks**
1. Record work & viva- voce: 2 hr duration	15 +5 = 20
2. Field Visit & viva-voce: 2 hr duration	30 +10 = 40
3. Field Survey & viva-voce: 4 hr duration	15 + 5= 20
4. Internal Evaluation	20
Total	100

Surveying-Introduction, Importance and Types - Traverse Survey, Triangulation Survey, Tacheometric Survey.
Surveying Instrument - Working Principal and Uses: Theodolite.
Preparation of Map using Theodolite/ Electronic Digital Theodolite.
Preparation of Geomorphic Maps from Field Data.
Evaluation of Practical Notebook and Viva-Voce

Field Study Tour: Field study is a part of curricula in M.A./ M.Sc. IV Semester. The study tour is to be conducted for a duration of at least one week. Submission of study tour report with suitable maps and diagrams is compulsory. Comprehensive Geographical/topographical survey of settlement will be done. The tour report must be done with the consultation of the staff in charge and must be submitted to the department at the time of the 4th semester practical examination. Viva voce based on study tour report would be conducted at the end.

Suggested Readings:

Barry Kavanagh and Frank W. G. T. Bailey "Surveying for Construction"

Charles D. Ghilani and Paul R. Wolf "Elementary Surveying: An Introduction to Geomatics" Basak N. N. "Surveying and Levelling"

Charles L. Cheetham "Introduction to Geodetic Surveying"

Chauhan, P. R. "Practical Geography" Wasundhara Prakasan Gorakhpur.

David M. Clark "Engineering Surveying"

Dickinson, G.C.: Statistical mapping of statistics, London

Dorling, D. and Fairbirn, D. 1997: Mapping Ways of Representing the World, Longman. England.

Kanetkar, T.P. "and Kalkarni, S.V. Surveying and Leveling" part 1, Page 355

Kellaway, G. P. 1970: Map Projections, Methun and Co. Ltd., London.

Khan, Z A: Text book of Practical Geography, Concept, New Delhi, 1998.

Lawrence, GRP: Cartographic Methods, London, 1971.

Maceachren, A. M. and Taylor, D. R. F. 1994: Visualization in Modern Cartography, Permamon. UK.

Monkhouse F.J. and Wilkinson, H.R. 1971: Maps and Diagrams: Their Compilation and Construction, B.I. Publications Private Limited, New Delhi.

Monkhouse, FJ & Wilkinson HR: Map & Diagram, Methuen, London, 1994.

Robinson AH et,al. : Elements of Geography, John Willey, New York, 1995.

Sarkar, A K: Practical Geography: A Systematic Approach, Oriental Longman, Calcutta, 1997.

Saroj K. Pal: statistics for Geosciences- Techniques and applications, Concept, New Delhi, 1998.

Singh LR. & Singh R. Mapwork and Practical Geog. p. 154