

Maharaja Ganga Singh University, Bikaner

SYLLABUS

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

(Choice Based Credit System)

Session:- 2023-24

Submitted by:

Prof. Pushendra Singh

Convenor, Board of Studies for Geography

Maharaja Ganga Singh University

Table of Contents

Sr. No.	Item	Page No.
1	Background	2-3
2	Programme Outcomes	4-5
3	Programme Specific Outcomes	5
4	Postgraduate Attributes	6
5	Structure of Masters Course	7

6	Learning Outcome Index	8
7	Semester-wise Courses and Credit Distribution	9-10
8	Course-level Learning Outcomes	11-29
9	Teaching-Learning Process	30
10	Blended Learning	30
11	Assessment and Evaluation	31
12	Keywords	32
13	References	32

About the Department

Department of Geography was established in the MGS University in 2018. The courses offered by the Department includes B.A. (Honors) and M.A./M.Sc. in Geography. Admissions are made on merit basis. Department has a panel of guest faculty members for engaging classes. Departmental library is stocked with good number of reference and text books on the core and allied subjects. Departmental laboratory is equipped with almost all required instruments and related paraphernalia.

Background

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

The process of revamping the curriculum started with 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, alignment of Vocational courses with the International Standard Classification of Occupations maintained by the International Labour Organization; breaking the silos of disciplines; integration of extra-curricular and curricular aspects; exploring internships with local industry, businesses, artists and crafts persons; closer collaborations between industry and higher education institutions for technical, vocational and science programmes; and formative assessment tools to be aligned with the learning outcomes, capabilities, and dispositions as specified for each course. The University has also developed

consensus on adoption of Blended Learning with 10% component of online teaching and 90% face to face classes for each programme.

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

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

Programme Outcomes (PO)

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 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 a 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

Process of course development involving various stakeholders at different stages:

1. Appointment of syllabus revision committee comprising all the members of the Board of Studies for Geography.
2. Draft of revised syllabus was circulated among all the faculty members of Government Dungar College’s Geography Department.
3. Draft of syllabus sent to more than 10 external experts including alumni and international reviewers.
4. Incorporation of suggestions/changes in the draft syllabus.
5. Draft of revised syllabus submitted to the Faculty of Science for consideration & approval.
6. Revised syllabus sent for statutory approvals in the University.

Structure of Programme

Ist Semester: Four Core Compulsory Courses, One Foundation Course, and One Practical Course

GCC-101	Geography Core Compulsory	Geo-tectonics and Geomorphology
GCC-102	Geography Core Compulsory	Weather and Climate
GCC-103	Geography Core Compulsory	Hydrology
GCC-104	Geography Core Compulsory	Biogeography
GFC – 01	Geography Foundation Course (Audit)	Elementary Concepts of Geography
Practical		

IIrd Semester: Four Core Compulsory Courses, One Foundation Course, One Practical Course

GCC-201	Geography Core Compulsory	Resources and Economic activities
GCC-202	Geography Core Compulsory	Population and Settlement geography
GCC-203	Geography Core Compulsory	Quantitative Techniques
GCC-204	Geography Core Compulsory	Regional Planning and Development
FC – 02	Foundation Course (Audit)	Human Values
Practical		

IIIrd Semester: Two Core Compulsory, One Core Elective, One Elective Open, One Practical Course

GCC -301	Geography Core Compulsory	Environmental Geography
GCC -302	Geography Core Compulsory	Political Geography
GCE-303	Geography Core Elective	(A) Eurasia: Physical Setting and Geographical Issues OR (B) Americas: Physical Setting and Geographical Issues
GEO-304	Geography Elective Open	(A) India: Physical Setting and Geographical Issues OR (B) Geo-spatial Techniques for Earth Surface Observation
Practical		

IVth Semester: Two Core Compulsory, One Core Elective, One Elective Open, One Practical Course

GCC-401	Geography Core Compulsory	Urban Geography
GCE -402	Geography Core Elective	(A) Cultural and Social Geography OR (B) Geography of Health
GEO -403	Geography Elective Open	(A) Rajasthan: Physical Setting and Geographical Issues OR (B) Oceanography
GCC-404	Geography Core Compulsory	Dissertation
Practical		

Learning outcome Index of the courses

(i) Programme outcome (PO) and programme Specific Outcome(PSO)

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
PO1	✓	✓		✓	✓	✓
PO2	✓		✓	✓		✓
PO3		✓	✓		✓	
PO4	✓	✓		✓		✓
PO5			✓	✓		✓
PO6		✓			✓	

(ii) Programme Specific Outcome (PSO) and Core Courses

	GCC 101	GCC 102	GCC 103	GCC 104	GCC 201	GCC 202	GCC 203	GCC 204	GCC 301	GCC 302	GCC 401	GCC 404
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 402 A	GCE 402 B	GCO403A	GEO403 B
PSO1	✓	✓	✓	✓	✓	✓		✓
PSO2		✓	✓	✓	✓	✓		
PSO3	✓		✓	✓		✓	✓	
PSO4		✓		✓	✓			
PSO5	✓		✓		✓		✓	✓
PSO6	✓	✓				✓		✓

**Semester Wise Credit Distribution as per
CHOICE BASED CREDIT SYSTEM (CBCS)**

Paper Code	Paper Name	Course	L e c t u r e / E x a m	T u t o r i a l	P r a c t i c a l	Total Credits	Maximum Marks		Minimum Passing Marks
							Internal Marks	External Marks	
Semester-I									
Theory Papers									
GCC-101	Geo-tectonics and Geomorphology	Core Compulsory	3	1	1	5	10	40	13 (25 %)
GCC-102	Weather and Climate	Core Compulsory	3	1	1	5	10	40	13 (25 %)
GCC-103	Hydrology	Core Compulsory	3	1	1	5	10	40	13 (25 %)
GCC-104	Biogeography	Core Compulsory	3	1	1	5	10	40	13 (25 %)
GFC – 01	Elementary Concepts of Geography	Foundation Course	2	2	1	5			
							40	160	
							Total Theory Marks	200	72 (36% aggregate)
Practical									
Practical		Core Compulsory					25	75	36 (36% aggregate)
Total Credits						25	Grand Total	300	
Semester-II									
Theory Papers									
GCC-201	Resources and Economic activities	Core Compulsory	3	1	1	5	10	40	13 (25 %)
GCC-202	Population and Settlement geography	Core Compulsory	3	1	1	5	10	40	13 (25 %)
GCC-203	Quantitative Techniques	Core Compulsory	3	1	1	5	10	40	13 (25 %)
GCC-204	Regional Planning and Development	Core Compulsory	3	1	1	5	10	40	13 (25 %)
FC – 02	Resources and Economic activities	Foundation Course	2	2	1	5			
							40	160	
							Total Theory Marks	200	72 (36% aggregate)

Practical										
Practical		Core Compulsory					25	75	36 (36% aggregate)	
Total Credits						25	Grand Total	300		
Semester-III										
Theory Papers										
GCC -301	Environmental Geography	Core Compulsory	3	1	1	5	10	40	13 (25 %)	
GCC -302	Political Geography	Core Compulsory	3	1	1	5	10	40	13 (25 %)	
GCE-303	(A) Eurasia: Physical Setting and Geographical Issues (B) Americas: Physical Setting and Geographical Issues	Core Elective	3	1	1	5	10	40	13 (25 %)	
GEO-304	(A) India: Physical Setting and Geographical Issues OR (B) Geo-spatial Techniques for Earth Surface Observation	Elective Open	3	1	1	5	10	40	13 (25 %)	
							40	160		
							Total Theory Marks	200	72 (36% aggregate)	
Practical										
Practical		Core Compulsory					25	75	36 (36% aggregate)	
Total Credits						20	Grand Total	300		
Semester-IV										
GCC-401	Urban Geography	Core Compulsory	3	1	1	5	10	40	13 (25 %)	
GCE -402	(A) Cultural and Social Geography OR (B) Geography of Health	Core Elective	3	1	1	5	10	40	13 (25 %)	
GEO -403	(A) Rajasthan: Physical Setting and Geographical Issues OR (B) Oceanography	Elective Open	3	1	1	5	10	40	13 (25 %)	
GCC-404	Dissertation	Core Compulsory	0	4	1	5	20	80	36 (25 %)	
							40	160		
							Total Theory Marks	200	72 (36% aggregate)	

Practical				
Practical	Core Compulsory	25	75	36 (36% aggregate)
Total Credits		20	Grand Total	300

M.A./M.Sc. First Semester

Paper GCC 101	Geo-tectonics and Geomorphology
Paper GCC 102	Weather and Climate
Paper GCC 103	Hydrology
Paper GCC 104	Biogeography
Paper GFC-01	Elementary Concepts of Geography Practical

Course Title: Geo-tectonics and Geomorphology

Course Code: GCC 101

Time: 3 Hours

M.M. 40+10

Unit I

Origin of Earth's Magnetic Field; Palaeomagnetism; Plate Tectonics as a Unified Theory of Global Tectonics; Tectonic and Neo-tectonic processes; Earth's Interior-with special reference to Seismology; Earth Movements; Endogenetic Processes-Faulting and Folding; Vulcanism and associated structures.

Unit II

Exogenic Processes; Weathering; Mass Movement- Controlling Factors and Landforms; River Channel Patterns (Straight, Meandering, Braided); Factors regulating Entrainment, Transportation and Deposition of Sediments in Rivers; Fluvial Landforms; Dynamics of Aeolian, Glacial and Marine processes and landforms; Morphodynamics of Barchans and Longitudinal Dunes.

Unit III

Models of Landform Development by Davis, Hack and Young; Application of Geomorphology in Feasibility Assessment of Engineering and Industrial Projects; Geomorphic Approach to Hazard Studies; Morphogenetic Regions; Regional Geomorphology of Thar Desert and Aravalli Region.

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 Text Book of Geomorphology*, Shukla Book Depot. Patna
- Dury, G.H., 1967, *Essays in Geomorphology*, 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 York
- Goguel, J. and Thalman, H. E., 1962, *Tectonics*, W.H. Freeman and Company
- 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 Allen 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 Rajasthan*, 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: Weather and Climate

Course Code: GCC 102

Time: 3 Hours

M.M. 40+10

Unit I

Composition and Structure of atmosphere; Insolation; Temperature and its Inversion; Adiabatic processes and Instabilities; Green House Effect; Pressure and Wind Distribution; Forces controlling Motion of air; Jet Stream; General Circulation in the atmosphere; Precipitation- Causes, Forms, Types.

Unit II

Air Masses and Fronts- Types, Characteristics and Weather Conditions; Monsoon- Distribution, Characteristics and Theories of Origin; Extreme Weather Events- Cloudbursts; Ocean-Atmospheric Interaction- El Nino, Southern Oscillation (ENSO) and La Nina; Cyclones- Temperate and Tropical (Distribution, Characteristics and Origin); Norwesters and Western Disturbances in India.

Unit III

Climatic Classification of Koeppen and Thornthwaite; Climatic Changes- Evidences, Possible Causes; Global Warming- Causes, Environmental and Social Impacts; Weather Forecasting; Applied Climatology- Data Collection, Interpretation and Generation of climatic information in reference to Agro-climatology (Water Budget and Crop Calendar), Urban Climatology (Urban Heat Island and Architecture), Bio-Climatology (Human Comfort and Morbidity).

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, London
Taylor, 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: Hydrology
Course Code: GCC 103

Time: 3 Hours

M.M. 40+10

Unit I

Distribution of World's Water Resources; Hydrological Cycle; Global Water Balance; Man's Interference in Hydrological cycle; Regional Water Budget; Elements of Hydrological Cycle: Precipitation- Intensity and Duration, Evaporation, Infiltration, Surface Runoff; Physical and Chemical Properties of Fresh Water (BIS, WHO).

Unit II

Basin Hydrological Phenomena and Hydrograph Analysis; Stream Rises: Factors, Classification and Measurement; Ground Water- Occurrence and Types; Dynamics of Ground Water: Recharge, Storage, Discharge and Movement (Darcy's Law); Principles of Water Balance and their Application, Its relevance in Crop Geography.

Unit III

Factors of Global Water Scarcity: Land Use / Land Cover Change and Human Consumption; Concept, Problems and Strategies of Water Resource Management; Consumptive and Non-Consumptive Utilization of Water Resource: Agriculture, Industry, Domestic and Recreation; Conjunctive Use of Surface and Groundwater Resources; Floods and Droughts- Occurrence and Management; Integrated Basin Planning; Approaches to Surface Water Management: Watershed and Rain Water Harvesting.

Suggested Readings:

Chorley, R.J. (1969). *Water, Earth and Man*. Methuen, London.
Chow, V.T., Maidment, D. R. and Mays, L.W. (1988). *Applied Hydrology*. McGraw Hill, New York.
Linsey, K., Kohler, M. and Paulhus, J. L. (1975). *Applied Hudrology*, Tata McGraw Hill, New York.
Raghunath, H. M. (1997). *Hydrology: Principles, Analysis, Design*. New Age, New Delhi.
Todd, D.K. (1959). *Ground Water Hydrology*. John Wiley & Sons, NewYork.

Course Title: Biogeography

Course Code: GCC 104

Time: 3 Hours

M.M. 40+10

Unit I

Nature and Scope of Biogeography; Development of Biogeography: Age of Reason (1600-1850), Evolution by Natural Selection (1850-1900), Evolution and Continental Drift (1900-1950), and Ecological and Historical (1950-2000); Biogeography and Evolution: Founder and Vicariance Effects, Adaptive Radiation and Evolutionary Convergence (Darwin, Wallace and Hook); Relationship between Evolution and Extinction of Species; Centres of Origin; Dispersalist Model.

Unit II

Biogeographic Distribution and Reconstruction of Evolutionary History; Palaeobotanical and Palaeo climatological records of environmental change in India; Environment, Habitat and Plant-Animal Association: Biome types; Habitat Factors and Adaptation of Plants; Phytogeographical Regions; Relationship of Forests with Hydrological Cycle; Ethno-Botany.

Zoogeography and its Environmental Relationship; Zoo-geographical Regions of the World.

Unit III

Conservation of Biodiversity: Restoration and Conservation of Habitat in Tropical Regions; Germplasm and Biopiracy; Ecosystem as a Model of Reality; Types of Ecosystem Models; Human Ecology: Origin, Principles, Traditions and Recent Trends; Wildlife Management in India.

Suggested Readings:

Brown, J.H. and Lomolino, M.V (1998). Biogeography. Sinauer Associates Inc., Sunderland, Massachusetts.

Cox, C. B. and Moore, P.D. (2000). Biogeography – An Ecological and Evolutionary Approach. Blackwell Scientific Ltd. pp. 298. London.

Fahrig, L., and K. Freemark. (1994). Landscape-scale effects of toxic events for ecological risk assessment. In J. Cairns and B.R. Niederlehner (eds.), Ecological Toxicity Testing, Scale, Complexity, and Relevance. Lewis Publishers, Boca Raton, FL.

Weinstein, D.A., and H.H. Shugart. (1983). Ecological modeling of landscape dynamics. In H.A. Mooney and M. Godron (eds.), Disturbance and ECOsystems. Springer-Verlag, New York.

Chapman J.L. and Reiss, M.J. 1993: Ecology: Principles and Applications, Cambridge University Press, Cambridge.

Myers, A.A. and Giller, P.S. (editors) 1988: Analytical Biogeography: An Integrated Approach to the Study of Animal and Plant Distributions, Chapman and Hall.

Ricklefs, R.E. 1993: The Economy of Nature: A Textbook in Basic Ecology, 3rd edition, W.H. Freeman and Co. New York.

Sharma, P.D. 1996: Ecology and Environment, 71h edition, Rastogi Publications, Mirat.

Tivy, J. 1993: Biogeography: A Study of Plants in the Ecosphere, 3rd edition, Longman Scientific and Technical, Harlow:

Beeby, A. and Brennan, A.M. 1997: First Ecology, Chapman and Hall, London.

Dash, M.C., 1993: Fundamentals of Ecology, Tata McGraw-Hill, New Delhi.

Dobson, A.P. 1996: Conservation and Biodiversity, Scientific American Library, New York.

Galbraith, I. 1990: Ecosystem and People: An Introduction to Biogeography, Oxford University Press, Oxford.

Jeffries, M.J. 1997: Biodiversity and Conservation, Routledge, London.

Kormondy, E.J. 1984: Concepts of Ecology, 3rd edition, Prentice-Hall, India, New Delhi.

Odum, E.P. 1997: Ecology: A Bridge between Science and Society, Sinaur Associates Inc. Publishers, Sunderland.

World Wide Fund for Nature-India (Eastern Region) 1995: Nature Conservation Handbook, Calcutta.

Macdonald .G (2003): Biogeography, John Wiley & Sons,INC

Cox & Moore, 2000: Biogeography,Blackwell Science

Watts D (1971): Principles of Biogeography, McGraw Hill,London

Mathur H S: Essentials of biogeography, Pointer Publishers Jaipur

Course Title: Elementary Concepts of Geography

Course Code: GFC – 01

Time: 3 Hours

M.M. 40+10

UNIT I

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

Focus on the dynamic relationship between Man and Environment: Determinism vs Possibilism;

Ascertaining location on Earth's Surface: Determination of latitude and Longitude and evolution of mapping techniques

Age of Exploration and Discovery of Continents

UNIT II

Attributes of Place: Location and Locality, Geometry, Geographical Environment Dualisms in Geography: Physical and Human Geography; Idiographic and Nomothetic Approaches;

Theoretical (agricultural, industrial, and central place models) and Applied Geography (spatial diffusion and GIS based mapping and environmental simulations)

Approaches to Regional study: Uniqueness of Region, Region as an Organism; Unit for Spatial Planning and Organisation

UNIT III

Geography in Colonial and Post Colonial period \

Paradigms in Geography

Positivism and quantitative revolution;

Behavioural Geography;
Radicalism and Development of Critical Geography;
Welfare approach in Geography;
Geography of Inequality;
Social Justice and Environmental Justice;
Humanistic Approach in Geography;
Post modernistic approaches in Geography

Suggested Reading:

- Adhikari, S. (1992). Geographical Thought. Allahabad: Chaitanya Pub. House.
- Blis, H. J. (1971). Geography Regions and Concepts. New York: John Wiley and Sons INC.
- Board, C., Chorley, R., & Stoddart, D. (1974). Progress in Geography. International Reviews of Current Research Vol - 6.
- Bunge, W. (1962). Theoretical 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: Today's and Tomorrow's Printers and Publishers.
- Peet, R. (2003). *Radical Geography*. New Delhi: Rawat Pub.Co.
- Peet, R., & Thrift, N. (1989). *New Models in Geography*. Boston, Sydney, Wellington: Unwin Hyman.
- Raju, S., & Lahiri-Dutt, K. (2011). *Doing Gender Doing Geography Emerging Research in India*. UK: Routledge.
- Rana, L. (2008). *Geographical Thought - A Systematic Record of Evolution*. New Delhi: Concept Publishing Company.
- Smith, D. (1994). *Geography and Social Justice*. Oxford, UK & Cambridge, USA: Blackwell.

Practical

Time: 3 Hours

M.M. 75+25

Spatial data import;
 Geo-referencing of analogue maps;
 GIS based mapping of point scale features: shopping complex; cinema hall; school; residential building, linear features: roads; railway lines; canals; drainage channels, and polygonal features: state, district, village panchayat boundaries, Linking spatial and attribute data; Spatial Queries,
 Evaluation of Practical Note Book and Viva-Voce

Suggested Readings:

- Walford, P., 1995: *Geographical Data Analysis*, John Wiley and Sons Inc., New York
- Chaisman, N. 1992: *Exploring Geographical Information Systems*, John Wiley and Sons Inc., New York.
- Lillesand, T.M. and Kiefer, R. W. 1994: *Remote Sensing and Image Interpretation*, 3rd edition, John Wiley and Sons, New York. Oxford and IBH Pub. Pvt. Ltd., New Delhi
- Sabins, F.F., 1997 : *Remote Sensing: Principles and Applications*, 3rd edition, W.H. Freeman & Company, New York

M.A./M.Sc. Second Semester

Paper GCC 201	Resources and Economic activities
Paper GCC 202	Population and Settlement geography
Paper GCC 203	Quantitative Techniques
Paper GCC 204	Regional Planning and Development
Paper FC-02	Human Values* (To be Incorporated) Practical

Course Title: Resources and Economic Activities **Course Code: GCC 201**

Time: 3 Hours

M.M. 40+10

Unit I

Concept of Resource, Resistance and Neutral Stuff; Resource-creating Factors: Nature, Man and Culture; Concept of Resource Adequacy and Scarcity; Theories of Resources: Dependency and Resource Curse Theory; Resource Classification: Ackerman's Scheme; Common Pool Resources: Challenges and Management; Carrying Capacity and Resource Management; Energy (Petroleum and NonConventional) and Mineral (Iron Ore, Copper, Bauxite) Resources in the world.

Unit II

Agricultural Regions- Concepts and Delineation; World Agricultural Systems; Agribusiness; Green Revolution and Food Security in India.
Major Industrial Regions of the World; Spatial Distribution of Textile and PetroRefining Industries; Emerging Industries with special reference to Food Processing and ICT in India.
Concept of Accessibility and Connectivity; Transportation: Modes, Comparative Cost Advantage; Networks- Types and Network Graphs; Connectivity of Networks and their Measurement Indices.

Unit III

Basic Elements of World Economy; Spatial Structure of World Economy; Significance of Trade and its role in World and Regional Economy; Structural Adjustment in India with special reference to Globalization, Liberalization and Privatization; World Trade Organization (WTO) and Intellectual Property Rights (IPR); Information Technology and its Impact on Trade: E-commerce.

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, OxfordUniversity 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 and Settlement Geography
Course Code: GCC 202

Time: 3 Hours

M.M. 40+10

Unit I

World and Indian patterns and determinants of Population distribution, density and growth; Theories of Population Growth: Malthusian, Neo-Malthusian, Social, Economic and Biological theories; Population Dynamics- Measurements of Fertility and Mortality;
Transnational Migration- Diaspora and Identity Crisis.

Unit II

Population Policy response to Demographic Transition.
Rural Settlements: Spatial and Ecological Approaches; Morphology of Rural Settlements- Internal Structure; Spatial distribution of Settlements: Size and Spacing of Rural Settlements; Types, Forms and Patterns of Rural Settlements- Causes and Effects.

Unit III

Theories regarding Internal Morphological Structure of cities; Functional Classification of villages and urban centres; Settlement Hierarchy- Theories of Christaller and Losch; City Region; Rural-Urban fringe; CBD- Characteristics and Delimitation.

Suggested Readings:

Agarwala and Sinha, 1977, India's Population Problems, Tata McGraw-Hill Publishing Co. Ltd., New Delhi
Bird, J., 1977: Centrality and Cities, Routledge, London

- Borooh, 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 Kegan 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
- Mandal,R.B(1989): Staistical Techniques for Social Scientist, Concept Pub. Co., New Delhi
- Misra, H.M. (ed.) 1987: Contributions to Indian Geography, Volume 9: Rural Geography, Heritage Pub., New Delhi.
- Misra. H. N. (ed) 1987: Contributions to Indian Geography, Volume 9: Rural Geography, Heritage Pub.,New Delhi.
- Mohan S., 2005: Urban Development and New Localism, Rawat Publications, Jaipur.
- Mumford, L., 1966, The City in History, Cox & Wyman Ltd., London
- Muramatsu, M. and Harper, Paul A., 1964: Population Dynamics, The Johns Hopkins Press
- Pacione, M., 2001: Urban Geography, Routledge, London
- Panda, P.C., 1990, Geomorphology and Rural settlements in India, Chugh Publications
- Racine, J. (ed): Calcutta 1981, Concept Pub. Co., New Delhi.
- Ramachandran R. 1989: Urbanisation arid Urban Systems in India, Oxford University Press, New Delhi.

Course Title: Quantitative Techniques

Course Code: GCC 203

Time: 3 Hours

M.M. 40+10

Unit I

Concepts of: Population, sample; parameter, statistics;
Measures of central tendency: mean, mode, median; Measurement
of dispersion: standard deviation, and variance; Correlation and
Regression.

Unit II

Concept of Probability;
Probability Distribution – Normal, Binomial and Poisson;
Sampling Techniques; Estimation from Sample (point estimate and interval estimate)
and
Standard Error of Mean; Confidence interval; Test of Significance ('t' test and 'z'
Test)

Unit III

Time Series Analysis: Moving Average, Cyclical Variation, Seasonal Index;
Interpolation and Extrapolation; Bi-variate
and multivariate statistics; Hypothesis
formulation and testing.

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 the Social Science. New Delhi: Vistaar Publication.

Course Title: Regional Planning and Development

Course Code: GCC 204

Time: 3 Hours

M.M. 40+10

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; 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 II

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; 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 III

Regional Plans of India; Concept of Multi-Level Planning: its need and characteristics, in reference to India; Decentralised Planning- characteristics and experience with respect to India; Peoples' Participation in the Planning Process; Administrative Structure and role of Panchayati Raj Institutions in Planning and Rural Development in India; Regional Development in India- Problems and Prospects.

Suggested Readings:

- Agarwal, A.N. (1995): Indian Economy, Problems of Development and Planning, Vishwa Prakashan, 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 Co.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: Roulledge.
- 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 International Perspectives. 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

Practical

Time: 3 Hours

M.M. 75+25

Instrumental Survey Credit: 4 (Marks: 50)

- Plain Table survey, Dumpy Level survey, Theodolite survey
- Triangulation, Traversing and Area Calculation Using Theodolite
- Tacheometric Survey: Land Use and Land Cover Mapping
- GPS Survey and Location Mapping

Suggested Readings:

- Elfic, M.H., Fryer, J.G. Brinkner, R.C. and Wolf, P.R. 1994: Elementary Surveying, 8th edition, Harper Collins Publishers, London.
- Hussain, S.K. and Nagaraj, M.S. 1992: Text Book of Surveying, S. Chand & Co. Ltd., New Delhi.
- Kanetkar, T.P. and Kulkarni, S. V. 1.988: Surveying and Levelling, Part I, Pune Vidyarthi Griha Prakashan, Pune.
- Kochher, C.L. 1993 : A Text Book of Surveying, S.K. Katariya & Sons, Delhi:
- Briggs, K (1978): Field Work in Geography

M.A./M.Sc. Third Semester

- Paper GCC 301** Environmental
Geography
- Paper GCC 302** Political Geography
- Paper GCE 303** (A) Eurasia: Physical Setting and
Geographical Issues
OR
(B) Americas: Physical Setting and
Geographical Issues
- Paper GEO 304** (A) India: Physical Setting and
Geographical Issues
OR
(B) Geo-spatial Techniques for Earth
Surface Observation
Practical

Course Title: Environmental Geography
Course Code: GCC 301

Time: 3 Hours

M.M. 40+10

Unit I

Environmental Geography: Concepts and Study of Ecological History;
Approaches to Environmental Studies: Environmentalist, Holistic, Organismic and
Human Ecological; Ecosystem: Meaning and concepts of ecosystem, Classification
and components of eco-system, Trophic structure, Ecological pyramid, Energy flow
and Biogeochemical cycle; Ecological regions of India.

Unit-II

Environmental pollution- meaning, types, sources, causes and impacts; Air, Water
and Land pollutions; Environmental Degradation – Nature, process, types and causes
of environmental degradation; Crisis in Biodiversity; Green house effect, Global
warming, Ozone depletion and Desertification.

Unit-III

Production Technology and Environmental Change, Technological Fix ; Carbon
Concentration and Sequestration; Red, Brown and Green Technology; Global
Resource Scarcity with special reference to Food and Energy; Tragedy of the
commons; Environmental Politics of Resource and Development with Special
Reference to Climate Change, Earth Summits and Protocols

Suggested Readings:

Adams, W.M. 1995: Green Development: Environmental Sustainability in the Third
World, Routledge, London

- Alexander, D. 1993: Natural Disasters, Research Press, New Delhi
- Allaby, M. 1996: Basics of Environmental Science, Routledge, 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 Hill, 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. (Reprint 2001). Instant Notes in Ecology, Viva Books Private Ltd. 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: Political Geography

Course Code: GCC 302

Time: 3 Hours

M.M. 40+10

Unit I

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

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

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

Unit III

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

Suggested Readings:

Agnew, John (1997) Political Geography: A Reader, Arnold, London

Adhikari, Sudepta (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.

Dikshit, R.D. Political Geography. Prentice Hall of India.

Cox, Kevin R. (2002) Political Geography: Territory, State, and Society, Blackwell Publishers, Oxford.

Course Title: Eurasia: Physical Setting and Contemporary Geographical Issues

Course Code: GCE 303 (A)

Time: 3 Hours

M.M. 40+10

Unit I

Asia: landforms, climate, vegetation, soils, population distribution, resource use and economic activities, urbanization

Unit II

Europe: landforms, climate, vegetation, soils, population distribution, resource use and economic activities, urbanization

Unit III

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.

Cole, J. P. (1996). A Geography of the World's Major Regions. Routledge, London.

Cole, J. P. (1975). Latin America- Economic and Social geography. Butterworth, USA.

Dickenson, J.P. et al. (1996). The geography of the Third World. Routledge, London.

Gourou, P. (1980). The Tropical World. Longman, London.

Kolb, A. (1977). East Asia- Geography of a Cultural Region. Methuen, London.

Minshull, G.N. (1984). Western Europe. Hoddard & Stoughton, New York.
Songquiao, Z.(1994). Geography of China. John Wiley, New York.
Ward, P.W. & Miller, A. (1989). World regional geography: A Question of Place.
John Wiley, New York.
Singh, Devendra Prasad. Adhunik Asia ka Bhugol. Sharda, Allahabad. Maurya,
S.D. Vishva ka Pradeshik Bhugol. Pravalika, Allahabad.

Course Title: Americas: Physical Setting and Contemporary Geographical Issues
Course Code: GCE 303 (B)

Time: 3 Hours

M.M. 40+10

Unit I

North America: landforms, climate, vegetation, soils, population distribution, recourse use and economic activities, urbanization

Unit II

South America: landforms, climate, vegetation, soils, population distribution, recourse use and economic activities, urbanization.

Unit III

Contemporary geographical issues: Spatial variations in levels of development; Poverty; Population Explosion; Impact of demographic transition; Impact of globalization; Environmental degradation; Rural-Urban Divide; Gender Discrimination.

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.

Patterson, J.H. (1985). Geography of Canada and the United States. Oxford Univ. Press.

Maurya, S.D. Vishva ka Pradeshik Bhugol. Pravalika, Allahabad.

Cole, J. P. (1996). A Geography of the World's Major Regions. Routledge, London.

Cole, J. P. (1975). Latin America- Economic and Social geography. Butterworth, USA.

Dickenson, J.P. et al. (1996). The geography of the Third World. Routledge, London.

Gourou, P. (1980). The Tropical World. Longman, London.

Ward, P.W. & Miller, A. (1989). World regional geography: A Question of Place. John Wiley, New York.

Singh, Devendra Prasad. Teen Dakshini Mahadwipon ka Bhogolik Adhyan. Sharda, Allahabad

Course Title: India: Physical Setting and Contemporary Geographical Issues
Course Code: GEO 304 (A)

Time: 3 Hours

M.M. 40+10

Unit I

Geology, Topography, landforms, climate, drainage, vegetation, soils.

Unit II

Distribution and use of: minerals, fossil fuel resources, hydro power and renewable energy resources; Agricultural crops and major industries; Population distribution; Urbanization.

Unit III

Contemporary geographical issues: Spatial variations in levels of regional development; Poverty; Impact of demographic transition; Impact of globalization; Environmental degradation; Gender Discrimination; Rural-Urban Divide.

Suggested Readings:

Agarwal, A.N. 1995: Indian Economy, Problems of Development and Planning, Vishwa Prakashan, 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, Routledge, 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. Tiwari, R.C. Geography of India. Pravalika, Allahabad.

Course Title: Geo-spatial Techniques for Earth Surface Observation

Course Code: GEO 304 (B)

Time: 3 Hours

M.M. 40+10

Unit I

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

Digital image processing techniques: contrast enhancement, band rationing, spatial filtering, PCA, Vegetation Indices,

Visual Image Interpretation, Unsupervised & Supervised Image Classification

Unit II

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 III

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

Suggested Readings:

Avery, T.E., and G.L. Berlin. Fundamentals of Remote Sensing and Airphoto 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

Practical

Time: 3 Hours

M.M. 75+25

Perspective projections of curved three dimensional earth surface on two dimensional paper sheet:

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

Graphical and GIS based construction of Gnomonic, Stereographic and Orthographic Projections

Graphical and GIS based construction of Mercator and Mollweide Projection Concept of UTM Projection and Conversion of Latitude and Longitude to UTM coordinates

Evaluation of Practical Note Book and Viva-Voce

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. Fourth Semester

Paper GCC 401

Urban Geography

Paper GCE 402

(A) Social and Cultural Geography

OR

(B) Geography of Health

Paper GEO 403

(A) Rajasthan: Physical Setting and Geographical Issues

OR

(B) Oceanography

Paper GCC 404

Dissertations

Practical

Course Title: Urban Geography

Course Code: Paper GCC 401

Time: 3 Hours

M.M. 40+10

Unit-I

Urban Geography: definition, nature, scope, and recent trends;

Urban revolutions and growth of towns and cities in the world (with particular reference to India).

Aspects of urban places: Location, site and situation - definition, nature and significance

Theories of Urban Evolution and Growth: Hydraulic Theory, Economic Theory.

Urbanism: Industrial, Modern and Postmodern

Unit-II

Stages of Urban Development: Urbanization, Suburbanization, Counter Urbanization and Re-urbanization

Urbanization processes and patterns in an era of globalization;

Urbanization process in India: colonial legacy, the post-independence characteristics;

Phases of urban development with location of economic activities in cities; Urban ecological processes.

Unit-III

Urban systems and the growth of cities: Rank-size distribution of cities, primate city distribution,

Central place theory of Christaller; the Urban Fringe.

Urban planning visions: the garden city, the radiant city;

Conserving urban landscapes; sustainability and the city; city environments and living conditions;

Urban development strategy with particular reference to India.

Suggested Readings:

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 Kegan 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
 Lillesand, T.M. and Kiefer, R. W. 1994: Remote Sensing and Image Interpretation. 3rd edition, John Wiley and Sons, New York
 Mandal, R.B. (2000): Urban Geography: A Textbook. Concept Pub. Co., New Delhi.
 Mandal,R.B(1989):Staistical Techniques for Social Scientist. Concept Pub. Co., New Delhi
 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 UrbanCentres under the Great Mughals. Shimla: Indian Institute of Advance Studies .
 Racine, J. (ed): Calcutta 1981. Concept Pub. Co., New Delhi.
 Raza, M., & Aggarwal, Y. (1999). Transport Geography of India. New Delhi: Concept Publishing Company.
 Ramachandran R. 1989: Urbanisation arid Urban Systems in India. Oxford University Press, New Delhi.

Course Title: (A) Cultural and Social Geography

Course Code: Paper GCE 402(A)

Time: 3 Hours

M.M. 40+10

Unit-I

The Nature Meaning & Scope of Cultural Geography

Approaches to cultural geography

The contributions of Otto Schluter and Carl Sauer Cultural

Areas & Cultural Realms.

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).

Social System: Structure and Processes; Caste, Religion and Language in India.

Unit-III

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

Course Code: GCE 402 (B)

Time: 3 Hours

M.M. 40+10

Unit I

Nature, scope and significance of Geography of Health; Development of this area; its distinction from Medical Science; Geographical factors affecting human health and diseases arising from them- Physical Factors (Relief, Climate, Soils, Vegetation), 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 II

Classification of Diseases- Genetic, Communicable and Non-Communicable; Occupational and Deficiency Diseases. WHO classification of diseases; Pattern of World distribution of major diseases; Ecology, Etiology and Transmission of major diseases: Cholera, Malaria, Tuberculosis, Hepatitis, Leprosy, Cardiovascular, Cancer, AIDS.

Unit III

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

Suggested Readings:

- Cliff, A. and Haggett, P. (1989). Atlas of Disease Distribution. Basil Blackwell, Oxford.
- Hazra, J., Ed. (1997). Health Care Planning in Developing Countries. University of Calcutta, Calcutta.
- Learmonth, A.T.A. (1978). Patterns of Disease and Hunger: A Study in Medical Geography. David & Charles, Victoria.
- May, J.M. (1959). Ecology of Human Disease. M.D. Pub., New York.
- May, J.M. (1970). The World Atlas of Diseases. NBT, New Delhi.
- Misra, R. P. (2007). Geography of Health. Concept, New Delhi.
- Narayan, K.V. (1997). Health and Development- Inter-Sectoral Linkages in India. Rawat, Jaipur.
- Philips, D.R. (1990). Health and Health Care in the Third World. Longman, London.
- Pyle, G. (1979). Applied Medical Geography. Winston Halsted Press, Silver Springs, USA.
- Rais, A. and Learmonth, A.T. A. Geographical Aspects of Health and Diseases in India.
- Sharma, H. S.: Medical Geography
- Stamp, L.D. (1964). The Geography of Life and Death. Cornell Univ., Ithaca.

Course Title: Rajasthan: Physical Setting and Geographical Issues

Course Code: GEO 403 (A)

Time: 3 Hours

M.M. 40+10

Unit I

Landforms, geology, climate, drainage, vegetation, soils

Unit II

Distribution and use of: minerals, fossil fuel resources, hydro power and renewable energy resources, agricultural crops, industries, population, economic activities, and urbanization

Unit III

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

Suggested Readings:

Sharma, H. S. and Sharma, M L. Geography of Rajasthan.

Bhalla, L R. Geography of Rajasthan.

Mishra, V. C. Geography of Rajasthan. NBT

Course Title: Oceanography

Course Code: GEO 403 (B)

Time: 3 Hours

M.M. 40+10

Unit-I

Definition and scope of oceanography, major sea voyages , oceanography and other sciences; distribution pattern of land and sea, origin of ocean basins :Wegner's drift hypothesis, and sea floor spreading and Plate Tectonics.

Unit-II

Depth of ocean, Ocean floor profile-continental shelf, slope, ridge and deeps, abyssal plains; Submarine canyons; Coral reefs-origin and distribution; Ocean deposits; Configuration of ocean floors of Indian Ocean and Atlantic Ocean.

Unit-III

Temperature of oceans; Salinity in oceans; Density of oceans; Tsunami; Ocean currents and their impact on climate and economy; oceans as source of food, mineral and energy resources; Sea-level changes: evidences, mechanism and impact.

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: Dissertation
Course Code: Paper ESCC 404

M.M.-50

The student will select a topic of research in consultation with his/her supervisor/guide to do a research work or carry out a case study on any topic related to environmental sciences.

The student shall prepare a report of his/her work carried out. The external examiner will evaluate the work carried out and shall award the marks accordingly.

Course Outcomes (COs)

CO1: Plan and engage in an independent investigation of a chosen research topic relevant to environment and society.

CO2: Systematically identify relevant concepts, methodologies, techniques and conclusions..

CO3: Able to do critical review.

CO 4: Communicate research concepts & contexts effectively both orally and in writing.

Suggested Readings:

Work on the Dissertation topic initiated in Semester III with seminar presentation is to be completed with report submission by the end of semester IV.

1. Bucchi, M. and B. Trench, editors. 2008. Handbook of Public Communication of Science and Technology. Routledge.
2. Bella Mody 2001 Designing Messages for Development Communication –An Audience participation-based approach. SAGE Publications.
3. Robert, A.D. and G. Barbara. 2006. How to Write and Publish a Scientific Paper, 6th Edition. Cambridge University Press.
4. Soraya, M.C. and A.S. Cynthia. 2001. Proposal Writing. Sage Publications.
5. Gregory, J. and S. Miller. 1998. Science in Public: Communication, Culture and Credibility. Plenum.
6. Holliman, R., et al., editors. 2009. Investigating Science Communication in the Information Age: Implications for Public Engagement and Popular Media. Oxford University Press.
7. Nelkin, D. 1995. Selling Science: How the Press Covers Science & Technology, 2nd Edition. WH Freeman.
8. Hoffmann, Angelika H. 2009. Scientific Writing and Communication: Papers, Proposals, and Presentations. Oxford.
9. Field, Anthony. 2003. How to Design and Report Experiments. Sage Publications.
10. Glass, David. 2006. Experimental Design for Biologists. Cold Spring Harbor Laboratory Press.
11. Underwood, A.J. 1997. Experiments in Ecology: Their Logical Design and Interpretation Using Analysis of Variance. Cambridge.

Practical

Time: 3 Hours

M.M. 75+25

- Analysis of Surface Topography (Absolute Relief, Relative Relief, Slope and aspect maps, Critical slope for specified activities, Profiles.
- Drainage Basin Analysis: Drainage Frequency, Drainage Density, Dissection Index and Ruggedness Index)
- Representation of Meteorological data – Pressure, Temperature, Precipitation, Humidity, wind using maps and diagrams

Teaching Learning Process

- Lectures
- Discussions
- Simulations
- Role Playing
- Participative Learning
- Interactive Sessions
- Seminars
- Research-based Learning/Dissertation or Project Work
- Technology-embedded Learning

Blended Learning

Preparation of Time Series of Land cover Change maps of nearby regions/localities, field research report, Participation in seminars/conferences, celebration of events related to environment, Script/play on developmental initiatives/achievements and environmental issues, social responsibility and community participation.

Assessment and Evaluation

- Continuous Comprehensive Evaluation at regular intervals to find out each course-level learning outcome i.e. Assignment, Test, Quiz, Seminars.
- Formative Assessment on the basis of activities of a learner throughout the program instead of one-time assessment, followed by Internal Assessment.
- Individual Assignments i.e. Case Study, Practical Record, Dissertation.
- Seminar Presentation, Field/Excursion report writing

Distribution of Credit

Semester	I	II	III	IV	Total
Credit	25	25	25	25	100

Academic Year	Semester	Core Compulsory	Core Elective	Open Elective	Foundation
Credit Distribution	I and II	80%	-	-	20%
	III and IV	40%	40%	20%	-

1 Credit = 10 Marks

Evaluation (Calculation of Score)

Credits & Marks (Theory)

Course Credit = 5

Total Marks = 50

Credits & Marks (Practical)

Course Credit = 10

Total Marks = 100

Grading

Grade Points	Description	% of Marks	Division	Grade
10	Outstanding	90-100	First	O
9	Excellent	80-89	First	A+
8	Very Good	70-79	First	A
7	Good	60-69	First	B+
6	Above Average	50-59	Second	B
5	Average	40-49	Third	C
4	Pass	36-39	Pass	P
0	Fail	Below 36	Fail	F
0	Absent	-	-	Ab

Performance Evaluation (Calculation)

(i) Semester Grade Point Average (SGPA)

$$SGPA (S_i) = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where G_i = Grade

C_i = Credit of Course

(ii) Cumulative Grade Point Average (CGPA)

CGPA = Sum of Credits X SGPA of Entire Program/ Sum of Credits up to the end of program

(iii) Conversion of CGPA into Percentage

Percentage % = 9.5 X CGPA (Adopted from CBSE pattern where 9.5 means that percentage should not be greater than 95%)

OR

* Conversion of CGPA into Percentage is subject matter of examinations section of the university.

Key-Words

LOCF = Learning Outcome Course Framework.

NEP 2020 = New Education Policy – 2020

CBCS = Choice Based Credit System

PO = Program Outcome

PSO = Program Specific Outcome

CCE = Comprehensive Continuous Evaluation

Reference

- † <https://www.education.gov.in/en/nep-new>
 - † The draft subject specific LOCF templates available on UGC website.
https://www.ugc.ac.in/ugc_notices.aspx?id=MjY5OQ==
 - † Draft Blended Mode of Teaching and Learning: Concept Note available on UGC website. https://www.ugc.ac.in/pdfnews/6100340_Concept-NoteBlended-Mode-of-Teaching-and-Learning.pdf
-