POST GRADUATE(MA/MSc) SEMESTER COURSE FRAMEWORK

Department of Geography, Kumaun University, NAINITAL

(Revised Course Framework w.e.f. from July, 2019)

Course Type	Name of Course	Course Code	Marks (75+25)
SEMESTER – I			
Core Course (Major)	(i) Advanced Physical Geography **(GMP***-CCM-i)**	**101**	75+25=100
	(ii) Natural Resource Management **(GMP-CCM-ii)**	**102**	75+25=100
	(iii) Advanced Geography of India **(GMP-CCM-iii)**	**103**	75+25=100
Elective Course	(iv-a) Soil Geography **(GMP-EC-i)**	**104**	75+25=100
	OR		
	(iv-b) Geography of Tourism **(GMP-EC-ii)**	**105**	75+25=100
	OR		
	(iv-c) Integrated Mountain Development with Special Reference to the Indian Himalaya **(GMP- EC- iii)**	**106**	75+25=100
Core Course (Minor)	(i) Dissertation (Minor) **(GMP-CCm-i)**	**107**	25
	(ii) Seminar/ Presentation **(GMP-CCm-**ii)	**108**	25
Practical	(i) Topographical Analysis, Basic RS, GIS & GPS **(GMP-P-i) &**	**109**	80
	(ii) Field Survey **(GMP-P-ii))**	**110**	20
SEMESTER – II			
Core Course (Major)	(i) Advanced Geomorphology **(GMP-CCM-i)**	**201**	75+25=100
	(ii)Urban Environment and Planning **(GMP-CCM-ii)**	**202**	75+25=100
	(iii) Evolution and Development of Geographical Thought **(GMP-CCM-iii)**	**203**	75+25=100
Elective Course	(iv-a) Remote Sensing Applications**(GMP-EC-i))**	**204**	75+25=100
	OR		
	(iv-b) World Regional Geography **(GMP-EC-ii)**	**205**	75+25=100
	OR		
	(iv-c) Bases of Hydrology **(GMP-EC –iii))**	**206**	75+25=100
Core Course (Minor)	(i) Dissertation (Minor) **(GMP-CCm-i))**	**207**	25
	(ii) Seminar/ Presentation **(GMP-CCm-ii)**	**208**	25
Practical	(i) Quantitative Techniques and Cartographic Representation of Geographical Data **(GMP-P-i) &**	**209**	80
	(ii) Field Survey **(GMP-P-ii)**	**210**	20
SEMESTER – III			
Core Course (Major)	(i) Environmental Management and Sustainable Development **(GMP-CCM-i)**	**301**	75+25=100
	(ii) Agricultural Geography and Agro-ecosystem Management **(GMP-CCM-ii)**	**302**	75+25=100
	(iii) Rural Development Planning **(GMP-CCM-iii)**	**303**	75+25=100
Elective Course	(iv-a) Climate Change, Impacts and Adaptation in Himalaya **(GMP-EC – i)**	**304**	75+25=100
	OR		
	(iv-b) Social and Cultural Geography **(GMP-EC-ii)**	**305**	75+25=100
	OR		
	(iv-c) Glacial Geomorphology **(GMP- EC – iii)**	**306**	75+25=100
Core Course (Minor)	(i) Dissertation (Minor) **(GMP-CCm –i)**	**307**	25
	(ii) Seminar/ Presentation **(GMP-CCm –- ii)**	**308**	25
Practical	(i) Surveying and Map Projections **(GMP-P-i) &**	**309**	80
	(ii) Field Survey **(GMP-P-ii)**	**310**	20
SEMESTER – IV			
Core Course (Major)	(i) Advanced Geography of Uttarakhand **(GMP-CCM-i)**	**401**	75+25=100
	(ii) Population Geography and Human Resource Development **(GMP-CCM-ii)**	**402**	75+25=100
	(iii) Biogeography **(GMP-CCM-iii)**	**403**	75+25=100
Elective Course	(iv-a) Integrated Watershed Management **(GMP-EC-i)**	**404**	75+25=100
	OR		
	(iv-b) GIS and GPS Applications **(GMP-EC-ii)**	**405**	75+25=100
	OR		
	(iv-c) Disaster Management **(GMP- EC – iii)**	**406**	75+25=100
Core Course (Minor)	(i) Dissertation (Major) **(GMP-CCm-i)**	**407**	75
	(ii) Seminar/Presentation **(GMP- CCm-ii)**	**408**	25
Practical	(i) Surveying, Interpretation of Geological Maps and Spatial Analysis**(GMP-P-i) &**	**409**	80
	(ii) Field Survey **(GMP-P-ii)**	**410**	20

* 75 Marks for Term-end Examinations.

** 25 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.

*** **GMP** = Geography Master Programme.

SEMESTER – I

Code : 101 (GMP-CCM – i)

ADVANCED PHYSICAL GEOGRAPHY

Paper - First

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit – I	**Fundamentals of Physical Geography:** Nature and scope of Physical Geography, Earth as a system, Geological time scale, Interior constitution of the earth, Isostatic balance, Plate tectonics.
Uni t – II	**Lithosphere - Epirogenetic Forces:** Origin of continents and ocean basins; Tetrahedral hypothesis of Green, hypothesis of Edward Swess, hypothesis of Wegner; Orogenetic Forces – Geosynclinal hypothesis of Kober, Sliding mass hypothesis of Daly, Convectional current theory of Arthur Holmes, Diastrophism and volcanism, Earthquake and seismicity.
Unit – III	**Lithosphere- Exogenetic forces**: Weathering and mass movement, Erosion; Erosion agents, Erosional processes, Development of drainage system, Development of river valleys, Paniplain.
Unit – IV	**Atmosphere:** Composition and structure of atmosphere, Insolation, Distribution of temperature (Vertical and Horizontal), Atmospheric pressure and winds, Precipitation.
Unit – V	**Hydrosphere:** Relief of the ocean floor, Composition of sea water, Distribution of temperature and salinity, Oceanic currents, Marine deposits, Coral landforms, Tides.

Books Recommended:

1. Wooldridge & Morgan : An Outline of Geomorphology
2. Thornbury : Principles of Geomorphology
3. Steers,J.A. : The Unstable Earth
4. Von Englen : Geomorphology

5. Sparks, B.W. : Geomorphology
6. Cottan, C.A. : Geomorphology
7. Holmes, A. : Principles of Physical Geology
8. Jolly, J. : Surface History of the Earth
9. Jeffeys, H. : The Earth
10. Wright, D.B. : Quaternary Ice Age
11. Coleman, A.P. : Ice Ages Recent and Ancient
12. Dutoit : Our Wandering Continents
13. Daily : Strength and Structure of the Continents
14. Miller, A. : Climatology
15. Kensdres, C.W. : Climates of the continents
16. Kendrew, A : Climatology
17. Blair, Thomas, A. : Weather Elements
18. Pattersons, S. : Introduction to Meteorology
19. Byers, H.K. : General Meteorology
20. Haurwitz & Austin : Climatology
21. Johnston, J. : An Introduction to Climatology
22. Sharma and Vatal : Oceanography for Geographers
23. Johnstone, J. : A Study of Oceans
24. Jenkins : Oceanography
25. Sverdrup : Oceanography for Meteorological
26. Singh, Savindra : Geomorphology (Hindi & English)
27. Critchfield, H.J. : General Climatology
28. Lal, D.S. : Jalvayu Vigyan (Hindi & English)
29. Dayal, P. : Bhoo Akriti Vigyan (Hindi), and 'A text Book of Geomorphology (Eng.) Patna
30. Siddhartha, K. : Atmosphere, Weather and Climate, New Delhi,1986
31. Siddhartha, K. : The Earth's Dynamic Surface, New Delhi,1998
32. Strahler & Strahler : Physical Geography; Science and Systems of the Human Environment, JohnWiley,1996

SEMESTER – I

Code : 102 (GMP-CCM – ii))

NATURAL RESOURCE MANAGEMENT
Paper – Second

Term End Exam. Marks : 75 Time: 03 Hours
Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)
Total Marks : 100

Unit – I	**Basic Framework:** Natural Resources: Concept; Classification and Process of Natural Resource Development.
Unit – II	**Application Remote Sensing and Geographic Information System (GIS) in Natural Resources Studies:** Resource Analysis; Resource Mapping; Natural Resources Information System.
Unit – III	**Ecology and Ecosystem:** Meaning, Scope, Types and Classification of Ecology and Ecosystem; Functioning of Ecosystem; Productivity of Ecosystem; Tropic Levels, Food Chain and Food Web.
Unit – IV	**Carrying Capacity of Natural Resources:** Production, Availability and Utilization of Natural Resources, Resource Efficiency, Carrying Capacity of Natural Resources with special reference to Himalaya.
Unit – V	**Natural Resource Management and Sustainable Development in Himalaya:** Concept and Approaches of Natural Resource Management, Community Based Natural Resource Management; Participatory Natural Resource Management; Natural Resources Management and Sustainable Mountain Development.

Books Recommended:

1. Zimmerman, E.W., World Resources and Industries, Harper and Row, London,1951
2. Paul, R.E. et.al, Eco-science: Population, Resource and Environment, W.H.Freeman, San Francisco, 1977 Wiley, New York,1977
3. G. Simmons, The Ecology of Natural Resources, Edward Arnold, London, 1974
4. ICIMOD, Mountains of the World –Ecosystem Services in a Time of Global and Climate Change: Seizing Opportunities – Meeting Challenges. Framework paper

prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Ministry of Environment, 2010

5. G. Rasul and M. Karki (eds) Policy Priorities for Sustainable Mountain Development, Kathmandu: International Center for Integrated Mountain Development, 2008
6. Huddlestone, B., Ataman, E. and d'Ostlanl, L. F., Towards a GIS-based analysis of mountain environments and populations, FAO, Rome, 2003
7. ICIMOD, Mountains of the world: ecosystem Services in a Time of global and climate change: seizing opportunities meeting challenges Framework paper prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Ministry of Environment
8. M.S.S. Rawat et al. (eds), Environment, Resources and Development of the Indian Himalaya, Transmedia Publication, Srinagar, Garhwal, Uttarakhand, India, 2018
9. Tse-ring, K., Sharma, E., Chettri, N., Shrestha, A. (eds), Climate change vulnerability of mountain ecosystems in the eastern Himalayas. Climate change impact on vulnerability in the eastern Himalayas-synthesis report. Kathmandu: ICIMOD, 2010
10. M. Beniston, Environmental change in mountains and uplands. London, 2000.
11. Food and Agricultural Organization, Food Security in Mountains – High time for action. Brochure of the International Mountain Day 2008. http://www.mountaineering.ie/documentbank/uploads/IMD08%20brochure.pdf
12. Food and Agricultural Organization, International Year of the Mountains. Food and Agriculture Organisation of the United Nations, Rome, 2002.
13. Food and Agricultural Organization, Land-water linkages in rural watersheds. Land and Water Bulletin 9. Food and Agriculture Organisation of the United Nations, Rome, 2002
14. Martin J. Haigh, Headwater control: integrating land and livelihoods, paper presented at the International conference on Sustainable Development of Headwater Resources. United Nation's International University, Nairobi, Kenya, September, 2002.
15. ICIMOD, Mountains of the World –Ecosystem Services in a Time of Global and Climate Change: Seizing Opportunities – Meeting Challenges. Framework paper prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Ministry of Environment, 2010

SEMESTER – I

Code : 103 (GMP-CCM – iii)

ADVANCED GEOGRAPHY OF INDIA

Paper - Third

Term End Exam. Marks	: 75	Time: 03 Hours
Internal Assessment Marks	: 25	(20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)
Total Marks	**: 100**	

Unit – I	**Physical Aspects:** Geological history, physiography and drainage patterns and systems; climate including origin and mechanism of the Indian monsoon, , soils and natural vegetation: distribution and utilization
Unit – II	**Population and other Human Aspects:** Population distribution, density and growth, population problems and policies. Sex and literacy differentials, Genesis of ethnic/racial diversities; tribal areas and their problems; trends of urbanization, population policy.
Unit – III	**Agricultural Senerio:** The infrastructure, irrigation, power, fertilizers and seeds, institutional factors-landholdings, tenure, consolidation and land reforms, agricultural efficiency and productivity, intensity of cropping, crop combination and agricultural regionalization, green,white,blue and yellow revolutions, dry zone agriculture and agricultural land use policy.
Unit – IV	**Industrial Resouce Base:** History of industrial development, factors of localization; Types of industry, study of mineral-based, agro-based and forest-based industries, household industry, engineering and other demand-based industries, new industrial policy; globalization and liberation, industrial complexes and industrial regionalization, Study of the transport network development: roadways, railways, airways and waterways.
Unit – V	**Regional Divisions of India:** Detailed study of Kashmir region, Uttarakahnd Himalaya, Lower Ganga Plain, Chota-Nagpur Plateau, Thar Desert, Aravali uplands, Andhra Plateau and West Coast region.

Books Recommended:

1. Spate & Learmonth — India and Pakistan
2. Singh, R.L.)ed.) — India, A Regional Geography
3. Tiwari, R.C. — Geography of India, Allahabad,2003
4. Gopalakrishnan,R. — Geography of India, Jawahar Publishers
5. Singh, Jagdish — India: A Comprehensive Systematic Geography, Gyanodaya Pr., Gorakhapur,2003
6. Sen Gupta, P. — Economic Regionalization of India, Census of India Publication, 1968
7. Mitra, Ashok — Levels of Economic Development of India, Census of India Publication, 1967
8. National Council of Applied Economic Research — Techno-economic Survey:
9. Bopse, A.(ed.) — Pattern of Population Change in India, 1951-1961
10. The Gazetteer of India, Vol.1
11. Pascoe, E.N. — A Manual of the Geology of India and Burma, Vols.I & II.
12. Wadia, D.N. — Geology of India
13. Puri, G.S. — Indian Forest Ecology, Vols. I & II
14. Davis, K. — Population of India and Pakistan
15. Sharma, T. — Location of Industries of India
16. Srivastava — Trade in India
17. Bose, Ashish — India's Urbanization, 1901-2001, New Delhi,1980
18. Siddhartha, K. — India, The Physical Aspects, New Delhi,1998
19. The Hindu- — (1) Survey of Indian Agriculture, 2002
(2) Survey of Indian Industry, 2003
20. Govt. of India (Ministry of India-2003 & onwards,Information & Broadcasting,Bharat-2003 & onwards, (Publication Division).

SEMESTER – I

Code : 104 (GMP-EC – i)

SOIL GEOGRAPHY

Paper – Fourth (a)

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit – I	**Conceptual Base:** Concept, scope, approaches and significance Soil Geography and its relationship with Pedology; Soil Forming Factors and profile.
Unit – II	**Soil Properties & Morphology:** Physical, Chemical and biological properties of soils; Soil Morphology; Soil Reaction.
Unit – III	**Formation & Capability:** Soil Forming Processes; Soil Catena, Land Capability and Land Suitability Classifications.
Unit – IV	**Taxonomy & Profiles:** Genetic Classification of soils; Soil taxonomy: Soils orders and sub-order level; Soil Landscape Mapping.
Unit – V	**Soil Degradation & Management:** Methods of Assessing Soil Erosion; Natural and Anthropogenic Factors of Soil Degradation; Soil Conservation and Management

<u>Books Recommended</u>:

1. Buckman, H.O. & Brady, N.C. (1960): York: MacMillan, 1960.

2. Bunting, B.T.(1967): The Nature and Properties of Soils, New Hutchinson.

3. Clarke, G.R. (1957): The Geography of Soils, London: Study of the Soil in the Field, Oxford: Oxford University press.

4. Jenny, H. (1941): Factors of Soil Formation, New York: Mc Graw Hill.

5. Robinson, G.W. (1949): Soils, their Origin, Constitution and Classification, London: Murley.

6. Russell, E.J.(1961) : The World of the Soil, Collins: fountaina Library.

7. Wilde, S.A. (1946) : Forest Soils and Growth , Waltham, Chronica Botanica

SEMESTER – I

Code : 105 (GMP-EC - ii)

GEOGRAPHY OF TOURISM

Paper – Fourth (b)

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit – I	**Introduction and the Concept:** Definition, Scope, Nature, Significance and Development of Geography of Tourism; Geography of Tourism as Applied Geography; The Tourist Phenomenon; Concept of Man, Environment and Tourism : The Interrelated Phenomena.
Unit – II	**Temporal Perspectives:** The Growth of Tourism through Ages; Growth of Modern Tourism; Tourist Motivation, The Basic Components of Tourism, Elements of Tourism, Tourism in India : Past and Present.
Unit – III	**Measurements and Dimensions of Tourism:** Measurement of Tourism: Basic concept and Need of Tourism Phenomena; Tourist: the Connotation; Types of Tourist Statistics; Methods of Measurement; The Importance of Measurement; The Organization of Tourism, The National Tourism Organization; Dimensions of World Tourism; International Tourist Movements.
Unit – IV	**Resort Towns and Morphology:** Analysis of Splendour Resources; Accommodation : Early History, Classification and Gradation, Attributes of Resort Towns, Morphology and Shape of Resort Towns, Parks and Wildlife Sanctuaries, Cultural, Social and Historical Attractions with special reference to Uttarakhand Himalaya.
Unit – V	**Tourist Industry and Environment:** Transport and Tourism, Spatial Interaction Determinants and Pattern, Tourism Marketing; Tourism Promotion; Social and Economic c Significance of Travel and Tourism; Domestic and Foreign Travel , Planning for Tourism, Eco- friendly Tourism, Environmental Consequences of Tourism, Tourism Planning with special reference to India and Uttarakhand State.

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Books Recommended

1. Arvil, R. (1967) : Man and Environment Crisis and Strategy of Choice, Penguin, Harmondsworth, 1967.
2. Berril, N.J. (1967) : Inherity the Earth- The Story of Man and Changing Planet, Forwcett, Greenwich, Connecticut, 1967.
3. Bhargava, Gopal (1992): Environmental Challenges and Ecological Disaster, Mittal Publication, New Delhi.
4. Botkin, D.B. (1982) : Environmental Studies, Charles, E. Meril and Keller, Edward, A. Publishing Co. Columus, Ohio.
5. C.S.E. (1984) : The State of India's Environment : A Citizens Report, Centre for Science and Environment, New Delhi.
6. Chada, S.K. (1993) : Fragile Environment, Anmol Publication, New Delhi.
7. Darlington, P.J. (1957) : Zoo-Geography : The Geographical Distribution of Animals, Wiley, New York.
8. Dasman, R.F. (1972) : Environmental Conservation, John Wiley and Sons, New York.
9. Detwyler, J.R. (1975) : Man's Impact on Environment, John Wiley and Sons, New York.
10. Khusoo, T.N. : Environmental Management Policies and Issues.
11. Knowles, R. and Wareing, J. : Economic and Social Geography.
12. Marsh, C..P. (1967): Man and Nature, Morvad.
13. Odum, E.P. : Fundamentals of Ecology, Prentice Hall.
14. Rustomji, N.K. and Ramble Charles (1990) : Himalayan Environment and Culture, Indus Publishing Company, New Delhi.
15. The Hindu : A Survey of Environment.
16. Robinson, H. (1976) : A Geography of Tourism, Macdonald & Evans Ltd. , Estober, Plymouth.
17. Bhatia, A.K. (1983) : Tourism Development: Principles and Practices,Sterling Publishers Pvt. Ltd., New Delhi.
18. Cosgrove, I. and Jackson, R. (1972) ; The Geography of Recreation and Leisure, Hutchinson.
19. White, J. (1967) : History of Tourism, Leisure Arts, London.

SEMESTER – I

Code : 106 (GMP – EC – iii)

INTEGRATED MOUNTAIN DEVELOPMENT WITH SPECIAL REFERENCE TO THE INDIAN HIMALAYA

Paper – Fourth (c)

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit – I	**World Mountains and Indian Himalayan Region:** Major Mountains of the World; Indian Himalayan Region; Location and Extent; Geology; Physiography; Climate and Drainage System; Demographic and Socio-cultural Characteristics.
Unit – II	**Mountain Natural Resources:** Land, Water, Forest, Wildlife; Biodiversity; Development and Utilization of Natural Resources.
Unit – III	**Global Environmental Changes and Mountain Region:** Environmental Changes; Drivers of Environmental Changes and their Consequences; Climate Change: Impacts and Adaptations; Natural Disasters-Challenges and Strategies in Mountains.
Unit – IV	**Mountain Institutions and Environmental Governance:** Concept and Classification of Institutions; Institutions in Himalaya; Role of Local and Regional Institutions in Environmental Governance in Himalaya.
Unit – V	**Integrated Development in Himalaya:** Concept of Integrated Development; UN Sustainable Development Goals and Himalaya; Integrated Mountain Development in Himalaya.

Books Recommended:

1. P. Wester, A. Mishra, A. Mukherji, A. B. Shrestha (eds), The Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability and People, Springer Nature Switzerland AG, Cham. pp., 2019
2. World Bank, South Asia's Hotspots Impacts of Temperature and Precipitation Changes on Living Standards, Report Preview Spring 2018, World Ban Group, Washington D.C. 2018
3. S. Irudaya Rajan, R. B. Bhagat eds, Climate Change, Vulnerability and Migration, Routledge, India, 2018

4. M.S.S. Rawat et al. (eds), Environment, Resources and Development of the Indian Himalaya, Transmedia Publication, Srinagar, Garhwal, Uttarakhand, India, 2018
5. Tor H. Aase, Climate Change and the Future of Himalayan Farming, Oxford University Press, 2017
6. Velma Grover et al.(eds), Global Change and Mountains: Consequences, Responses and Opportunities, Science Publishers, CRS Press, Taylor and Francis, USA, 2015
7. E. Grohmann et al. (eds), Environmental Deterioration and Human Health: Natural and Anthropogenic Determinents, Springer, Dordrecht, 2014
8. Ning, Wu; Rawat, G.S.; Joshi, S.; Ismail, M.; Sharma, E. (Eds) High-altitude rangelands and their interfaces in the Hindu Kush Himalayas. Kathmandu: ICIMOD, 2013
9. Jean Palutikof et al. (eds.) Climate Adaptation Futures, Wiley Publishing Company, U.K., 2013
10. C. Margottini et al. (eds), Landslide Science and P ractice, Vol. 4, Springer - Verlag, Berlin, Heidelberg, Germany, 2013
11. Velma Grover (ed) Impact of Climate Change on Water and Health, CRC Press, Taylor and Francis Group, 2013
12. G. Rasul and M. Karki (eds) Policy Priorities for Sustainable Mountain Development, Kathmandu: International Center for Integrated Mountain Development, 2008
13. Huddlestone, B., Ataman, E. and d'Ostlanl, L. F., Towards a GIS-based analysis of mountain environments and populations, FAO, Rome, 2003
14. ICIMOD, Mountains of the world: ecosystem Services in a Time of global and climate change: seizing opportunities meeting challenges Framework paper prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Ministry of Environment
15. IPCC, Climate change: Impacts, adaptation, and vulnerability, Part A: Global and sectoral aspects, Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Summary for policymakers, Cambridge University Press, Cambridge, United Kingdom and New York, USA, 2014
16. Tse-ring, K., Sharma, E., Chettri, N., Shrestha, A. (eds), Climate change vulnerability of mountain ecosystems in the eastern Himalayas. Climate change impact on vulnerability in the eastern Himalayas-synthesis report. Kathmandu: ICIMOD, 2010
17. M. Beniston, Environmental change in mountains and uplands. London, 2000.
18. Food and Agricultural Organization, Food Security in Mountains – High time for action. Brochure of the International Mountain Day 2008. http://www.mountaineering.ie/documentbank/uploads/IMD08%20brochure.pdf
19. Food and Agricultural Organization, International Year of the Mountains. Food and Agriculture Organisation of the United Nations, Rome, 2002.
20. Food and Agricultural Organization, Land-water linkages in rural watersheds. Land and Water Bulletin 9. Food and Agriculture Organisation of the United Nations, Rome, 2002
21. Martin J. Haigh, Headwater control: integrating land and livelihoods, paper presented at the International conference on Sustainable Development of Headwater Resources. United Nation's International University, Nairobi, Kenya, September, 2002.
22. ICIMOD, Mountains of the World –Ecosystem Services in a Time of Global and Climate Change: Seizing Opportunities – Meeting Challenges. Framework paper prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Ministry of Environment, 2010
23. ICIMOD, The Changing Himalayas: Impact of Climate Change on Water Resources and Livelihoods in the Greater Himalayas. ICIMOD, Kathmandu, Nepal, 2009

24. IPCC, Climate change 2007: The scientifi c basis. Working Group I contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report. Cambridge: Cambridge University Press, 2007
25. IPCC, Climate Change: Impacts, adaptation and vulnerability. Working Group II contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report. Cambridge: Cambridge University Press, 2007
26. Messerli, B. and Ives, J. D. (eds), Mountains of the world – A global priority. A contribution to Chapter 13 of Agenda 21. New York: Parthenon, 2007

SEMESTER – I

Code: 107 (GMP - CCm –i) : DISSERTATION (MINOR)

Total Marks Allotted for Dissertation	:	25
Evaluation by External Examiner	: 10	
Evaluation by Internal Examiner	: 10	
Viva – Voce Examination (by both the examiners)	: 05	

Problem oriented work based Dissertation

The students will be required to select the topic and area with the help of their respective supervisors allotted to them by the Department. Dissertation must be submitted to the Department one week before the commencement of the Theory Examinations. The size of the dissertation should normally range between 30 and 40 pages. The Dissertation will be evaluated by a panel of examiners appointed by the Convener of BOS, Geography. The evaluation and viva –voce examination will be conducted by both the external and internal examiners.

SEMESTER – I

Code: 108 (GMP - CCm–ii): SEMINAR/ PRESENTATION

Total Marks : 25

The students will be required to select any one of the topics allotted to them by the Department. The Topic will be related to the disciplines already studied by students in the same semester as core or elective courses. The assessment of the presentation of the students/examinees will be done by external and internal examiners appointed by the Convener/Head of the Department/ University.

SEMESTER – I

PRACTICAL

Code: 109& 110 (GMP - P-i & P-ii): TOPOGRAPHICAL ANALYSIS AND INTERPRETATION OF GEOLOGICAL MAPS (Pi); AND FIELD SURVEY (Pii)

Term End Exam	: Marks	:	60	Time: 04 Hours
Record Work	: Marks	:	10	
Viva Voce	: Marks	:	10	
Field Survey	: Marks	:	20	(Regional Field Survey will be organized in the supervision of Teachers nominated by the Department).

Total Marks : 100

Unit	I	Depiction of relief; Contours and contouring from spot heights; Altimetric frequency curve, block diagrams (one point perspective)
Unit	II	Slope and gradient, profiles, methods of slope analysis (e.g., Wentworth's & Smith's methods) construction of profiles, Hypsometric Curve.
Unit	III	Drainage Analysis: Ordering, Density, Frequency, Longitudinal Profiles.
Unit	IV	Representation of economic data: Agricultural land use & production and industrial data. Representation of population data: Growth, distribution and employment.
Unit	V	Geological Maps and their Interpretation; Folded and faulted structures, effect of relief on the sequence and pattern of rock outcrops..

Books Recommended:

1. Bygott, G.L. : Mapworks and Practical Geography
2. Mahmood, Aslam (1977) : Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
3. Mishra, R.P. and Ramesh, A. (1969) : Fundamentals of Cartography, Concept Publishing Company, New Delhi.
4. Singh, R.L. and Singh Rana, P.B. (1991) : Elements of Practical Geography, Kalyani Publishers, Ludhiana.
5. Singh, L.R. and Singh, R. (1991): Mapwork and Practical Geography, Central Book Depot, Allahabad.
6. Wilkinson, H.R. and Monkhouse, F.J. (1952) : Maps and Diagrams, B.I. Publications Pvt. Ltd., New Delhi.
7. Monkhouse, F.J. (1971) Maps and Diagrams, Methuen, London.
8. Derk, C.L. & Brown, U.S. Interpretation of Topographical and Geological Maps
9. Curran, P.J. (1985) Principles of Remote Sensing, Longman.

SEMESTER – II

Code : 201 (GMP-CCM – i)

ADVANCED GEOMORPHOLOGY

Paper – First

Term End Exam. Marks	: 75	Time: 03 Hours
Internal Assessment Marks	: 25	(20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)
Total Marks	**: 100**	

Unit – I	**Conceptual Base:** Nature, Scope, Trends and Development of Geomorphology; Classical Landscape Evolution / Development Theories: (W.M. Davis, W. Penck, L.C. King, Hack); Recent Trends in Geomorphology
Uni t – II	**Processes and Landforms:** Tectonic processes and tectonic landforms both large and small scales; Drainage patterns and systems, Periglacial processes and landforms; Glacial processes and landforms, Arid processes and landforms, Fluvial processes and landforms, Karst Topography;
Unit – III	**Landscape Evolution:** Radiocarbon dating, tree-ring dating (Dendrochronology), and Lichenometry. Interruptions in the evolution of landforms: Polycyclic landforms
Unit – IV	**Theories and Techniques:** Theories of Hill-slope Evolution; Erosion Surfaces; Geomorphic Mapping Techniques; Systems and Models in Geomorphology.
Unit – V	**Applied Geomorphology:** Geomorphic Hazards and Mitigation Measures; Geomorphology in Civil Engineering; Geomorphology and Groundwater Studies; Soil and Geomorphology; Application of geomorphology in agriculture and resource Management.

Books Recommended:

1.Bloom, A.L. (1978) : A Systematic Analysis of late Cenozonic Landforms, Englewed Cliffs, M.J. Prentice Hall.

2.Condle, K.C. (1989) : Plate Tectonics and Crustal Evolution. Pergamon Press. New York.

3.Chorley, R.J. (ed.) : Spatial Analysis in Geomorphology, London, Metheun.

4.Chorley, R.J. , S.A. Schum and D.E. Sugden (1985): Geomorphology, London

5.Coats, D.R. (1981. edt.). Geomorphology and Engineering, George Allen and Unwin, London.

6. Cooke, R.U. and J.C. Doornkamp (1974) : Geomorphology in Environmental Management, Oxford University Press.

7.Embleton, C. and J. Thornes : Processes in Geomorphology, London, Edward Arnold.

8.Garner, H.F. : The Origin of Landscape – A Synthesis of Geomorphology, Oxford University Press, London, 1974.

9. Goudie, A. (ed.) (1990): Geomorphological Techniques. London, George Unwin and Hyman.

10. Hart, M.G. (1986) : Geomorphology : Pure and Applied, George Allen and Unwin, London.

11. Holmes, A. : Principles of Physical Geology, 3 Edn. London . Nelson. 1978.

12. King, C.A. M. : Techniques in Geomorphology, 2nd Edn. London : Edward Arnold.

13. Leopold, L.B. : Fluvial Processes in Geomorphology.

14. Lobeck, A.K. : Geomorphology.

15. Ollier, C.D. : Weathering, Edinburgh : Oliver and Royd.

16. – do – : Tectonics and Landforms. London: Methuen.

17. Pitty, A.F. : Geomorphology and Rural Settlement in India.

18. Scheidegner, A.E. : Theoretical Geomorphology. Berlin : Springer –

19. Sharma, V.K. : Process in Geomorphology (Mc Graw Hill).

20. Small, R.J. : A Text Book on the Study of Landforms.

21. Thorn, C.E. : Introduction to Theoretical Geomorphology. Verlag.

22. Thornbury, W.D. : Principles of Geomorphology. New York : Wiley (1969).

23. Twidale, C.R. : Analysis of Landforms. New York : Wiley.

24. Worcester, P.G. : A Text Book of Geomorphology.

SEMESTER – II

Code: 202 (GMP-CCM-ii)

URBAN ENVIRONMENT AND PLANNING

Paper – Second

Term End Exam. Marks	: 75	Time: 03 Hours
Internal Assessment Marks	: 25	(20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)
Total Marks	**: 100**	

Unit – I	**Theoretical Base:** Basic concepts, meaning, scope of urban geography and planning, Significance of urban development planning in geography. Evolution of urban centres and Urbanization. Recent trends of urban growth with special reference to developing countries, Urban sprawl and its steering factors, Satellite towns.
Unit –II	**Morphology and Functions:** Urban morphology, Urban land use analysis and classification, Urban landscape. Functions of urban centres, Functional classifications of towns with special reference to India and Uttarakhand.
Unit – III	**Central Place System:** Towns as central places, Central places theory, Centrality and hierarchy of urban centres, Urbanization and regional development.
Unit – IV	**Urban Environmental Problems:** Environmental problems of urbanizations, Carrying capacity of urban settlements, Urbanization and global environmental change, Assessment of natural risks of urban growth with particular reference to developing countries, India and High mountains.
Unit – V	**Urban Planning and Management:** Concept and approaches of urban development, Landscape ecology and sustainable urban development, urban land use planning, management of natural risks of urban growth in Uttarakhand, Application of remote sensing and Geographic Information System in Urban Development Planning.

Books Recommended:

1. Alam, S.M. (1964) : Hyderabad – Secunderabad Twin Cities, Asia Publishing House, Bombay.
2. Berry, B.J.L. and Horton, F.F. (1970) : Geographic Perspective on Urban Systems, Prentice Hall, Englewood Cliffs, New Jersey.

3. Carter (1972) : The Study of Urban Geography, Edward Arnold Publishers, London.
4. Chorley, R.J.O. , Hagett P. (ed.) (1966) : Models in Geography, Methuen, London.
5. Dickinson, R.E. (1964) : City and Region, Routledge, London.
6. Dwyer, D.J. (ed.) (1971) : The City as a Centre of Change in Asia, University of Hongkong Press, Hongkong.
7. Gibbs, J.P. (1961) : Urban Research Methods, D. Van Nostrand Co. Inc., Princetown, New Jersey.
8. Hall, P. (1992) : Urban and Regional Planning, Routledge, London.
9. Hauser, Philip M. and Schnore Leo F. (ed.) (1965) : The Study of Urbanisation, Wiley, New York.
10. James, P.E. and Jones, C.F. (eds.) (1954) : American Geography, Inventory and Prospect, Syracuse University Press, Syracuse.
11. Kundu, A. (1992) : Urban Development and Urban Research in India, Khanna Publication.
12. Meyor, H.M. and Kohn, C.F. (eds) (1955) : Readings in Urban Geography, University of Chicago Press, Chicago.
13. Mumford, L. (1958) : Culture of Cities, McMilan and Co., London.
14. Nangia, Sudesh (1976) : Delhi Metropolitan Region : A Study in Settlement Geography, Rajesh Publication.
15. Rao, V.L.S.P. : Urbanisation in India : Spatial Dimensions, Concept Publishing Co., New Delhi.
16. Rao, V.L.S.P.(1979) : The Structure of an Indian Metropolis : A Study of Bangalore, Allied Publishers, Bangalore.
17. Singh, K. and Steinberg F. (eds.) (1998) : Urban India in Crisis, New Age Interns, New Delhi.
18. Smailes, A.E. (1953) : The Geography of Towns, Hutchinson, London.
19. Tewari, Vinod K. , Jay A. Weinstein, VLS Prakasa Rao (editors) (1986) : Indian Cities : Ecological Perspective Concept.

SEMESTER – II

Code : 203 (GMP-CCM – iii)

EVOLUTION AND DEVELOPMENT OF GEOGRAPHICAL THOUGHT

Paper – Third

Term End Exam. Marks	: 75	Time: 03 Hours
Internal Assessment Marks	: 25	(20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)
Total Marks	**: 100**	

Unit – I	**Basic Concepts:** Geography as the study of areal differentiation, Man-environment relationship and spatial organization; The measure of significance in geography, Time and genesis in Geography; Divisions and branches of geography and development of the main branches, Methods and approaches of Geography.
Unit – II	**Development of Geographical Thoughts:** Emergence of Geography as a scientific discipline: Contributions of Indian, Greek, Roman and Arab Geographers; Contributions of founders of Modern Geography: Impact of Explorations and discoveries; Contributions of German (Richthofen, Ratzel), French (Vidal de La Blache) and Anglo-American Geographers (Hartshorne, Huntington and Davis).
Unit – III	**Contemporary Trends:** Qualitative Paradigms and Changing Paradigms in Geography; Behavioral Revolution; Marxism, Radicalism and Welfare approach.
Unit – IV	**Nature of Dichotomies in Geography:** Physical and Human Geography; Systematic and Regional Geography, Determinism and Possibilism, Modernism and Post Modernism, Post Structuralism and Post Colonialism
Unit – V	**Recent Trends in Geography:** Modern Techniques and Concepts in Geography: Remote Sensing, systems approach and Geographic Information System.

Books Recommended:

1. Hartshorne, R. The Nature of Geography
2. Hartshorne, R. Perspective on the Nature of Geography
3. Minshull, R. The Changing Nature of Geography, London, 1970
4. Minshull, R. Regional Geography: Theory and Practice, 1967

5. Spate, O.H.K.	Let me Enjoy-Essays Partly Geographical
6. Taylor, G. (ed)	Geography in the Twentieth Century,1951
7. James & James (eds.)	American Geography -Inventory and Prospect, 1954
8. Wooldridge and East	The Spirit and Purpose of Geography, London, 1958
9. Wooldridge of	The Geographer as Scientist, essays on the scope and nature Geography; London, 1956
10. Board and Others	Progress in Geography, Vol.I to V
11. Harvey, D.	Explanation in Geography, London, 1969
12. Freeman, T.W.	A Hundred Years of Geography, London, 1961
13. Dickinson and Howarth	The making of Geography, Oxford, 1933
14. Spilphus	The Background of Geography
15. Bundury, E.H.	A History of Ancient Geography
16. Newton	Travels and Travelers in the Middle Ages
17. Pensore, B.	Travels and Discovery in Rennaissance,1952
18. Tozer, H.F.	A History of Ancient Geography
19. Kimbli,G.H.T.	Geography in the Middle Ages
20. Singh, L.R.	Bhoogol Ki Prakriti (in Hindi)
21. Brock, J.M.	Geography: Its scope and spirit
22. Stamp, L.D. &	London Essays in Geography, 1951 Wooldridge
23. Prakasa, Rao, V.L.S.	Regional Planning
24. Daysh, G.H.J.	Essay in Regional Planning
25. Dickinson, R.E.	City and Region- A Geographical Interpretation
26. Dickinson, R.E.	The Makers of Modern Geography,1969
27. Dickinson, R.E.	Geography as Ecology
28. Stamp, L.D.	Applied Geography
29. Singh, R.L.(ed.)	Applied Geography
30. William Bunge	Theoretical Geography
31. Haggett and Chorley	Models in Geography, London, 1967
32. Cooke, F.D. & Johnson	Trends in Geography
33. Haggett, Peter	Geography: A Modern Synthesis, New york, 1975
34. James, P.E.	All Possible Worlds-A History of Geographical Ideas, 1980
35. Helt Jensen, A.	Geography: Its History and Concepts
36. Dikshit, R.D.	Geographical Thought, Prentice Hall, India, 1997
37. Adhikari, S.	Fundamentals of Geographical Thought, Chaittanya, Allahabad
38. Haggett, P. & Chorley	Models in Geography, London, 1969
39. Chatterjee, S.P.	Fifty Years of Science in India: Progress of Geography, Calcutta, 1964
40. Kuhn, T.S.	The Structure of Scientific Revolution: Chicago, 1962
41. Cole & King	Quantitative Geography; Techniques, Theories in Geography, JWS, 1968
42. Smith, D.M.	Human Geography: A Welfare Approach; London, 1977
43. Richard Peet	Modern Geographical Thought: Badewell; 1998
44. Thomas & Hugget	Modeling in Geography, HRP,1980
45. R.de Souza (eds.)	Reflections on Richard Hartsorn's The Nature of Geography, AAG,1989
46. Harvey & Holly (eds.)	Themes in Geographic Thought, Rawat, 1969
47. Charlls Gore	Regions in Question, Mathur, London, 1984

48. Berry Markble (eds.) Spatial Analysis, Prentice Hall, 1968
49. Singh, Jagdish HkkSxksfyd fpUru ds ewyk/kkj]Kkuksn;]1995
50. Husain, Majid Evolution of Geographical Thought, Rawat, 2001
52. Johnston, Hauer & Regional Geography, London, 1990

SEMESTER – II

Code : 204 (GMP-EC – i)

REMOTE SENSING APPLICATIONS

Paper – Fourth (a)

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit – I	**Bases of Remote Sensing**: Definition, interaction of Electro-Magnetic Radiation (EMR) with atmosphere and earth surface. Sensors and remote sensing data products..
Unit – II	**Aerial Photographs and Photogrammetry:** Types of aerial photos, fundamentals of air photographs interpretation. Geometry of aerial photographs: tilt and relief displacement.
Unit – III	**Digital Image Processing**: Restoration; Enhancement and Classification: supervised and unsupervised
Unit – IV	**Thermal and Microwave Remote Sensing:** Types; Characteristics; utilization in geographical studies
Unit – V	**Remote Sensing Applications:** Application of Remote Sensing in terrain evaluation, land use and forest resource inventory.

Books Recommended:

1. Lillesand, T.M. & Kiefer,R.W. Remote Sensing and Image interpretation, Jhon Wiley & Sons, New York,1987.

2. Wolf, P.R. Elements of Photogrammetry, Mograw Hill, New York, 1983.

3. Smith,H.T.V. Aerial Photographs and their Applications, Appleton Centory Crafts, New York,1943.

4. Amerian Society of Photogrammetry, Manual of Photogrammetry, Falls Church,1980
5. American Society of Photogrammetry, Manual of Remote Sensing, Falls Church,1983.
6. Lindren, D.T. Landuse Planning and Remote Sensing, Niyheff,,Dordrecht, 1985
7. Siogal,B.S. and A.R.Gsllespio (eds.) Remote Sensing in Geology, Wiley, New York,1980
8. Muchrcke, P.C. Map Use-Reading Analysis and Interpretation, J.P.Publ.Madison,1986
9. Sprurr, S.H. Photogrammetry and Photo-Interpretation,Ronald Press, New York,1960
10. Avery, T.E.&Berlon,G.L. Interpretation of Aerial Photographs Burgess Minneapolies, 1985
11. Moffott.F.H. & Mikhail Photogrammetry, Harpor & Row, New York,1980
12. Stimson,A. Photometry and Radiometry for Engineers,Wiley, New York, 1974
13. Sabins, F.F.Jr. Remote Sensing Principles and Interpretation, Freeman, New York,1986
Basces, G.A. Digital Image Processing for Remote Sensing, Prentice Hall, 1984
15. Ekstrom, M.I. Digital Image Processing Techniques, Academic Press, New York,1984
16. Tomar, M.S. & M.R.Moslekar Aerial Photographs in Landuse and Forest Surveys, Jugal Kishor & Co.,Dehradun,1974
17. Curran, Paul J. Principle of Remote Sensing ,Longman Group,1985
18. Barrett,E.C. and L.F.Curties Photo Interpretation ,Mcmillan, New York,1982
19. Compbell, J. Introdution to Remote Sensing, Guilford, New York,1989
20. Hord. R.M. Digital Image Processing of Remotely Sensed Data Academic, New York
21. Luder, D. Aerial Photography Interpretation:Principles and Application, Mcgraw Hill, New York,1959
22. Pratt,W.K. Digital Image Processing Wiley, New York,1978
23.Rao,D.P.(eds.) Remote Sensing for Earth Reources, Association of Exploration Geo physicist,Hyderabad,1998
24. Thomas M.Lillesand & Ralph W.Kefer Remote Sensing and Image Interpretation, John Wiley & Sons, New York,1994

SEMESTER – II

Code : 205 (GMP-EC – ii)

WORLD REGIONAL GEOGRAPHY

Paper – Fourth (b)

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit – I	**Conceptual Base:** Regional Geography: Concepts, Approaches, Methods and Significance; Major World Regions and blocks (of macro, meso and micro levels) on various delimitation bases specially with reference to Natural, Political, Economic, Trade and Development Regionalization.
Unit – II	**Natural Regions of the World:** Physical Regions, Vegetation Regions, Climatic Regions, Bio-geographical Regions and Biomes
Unit – III	**Resource and Cultural Regions:** Resource Regions, Population Regions and Cultural Regions of the world
Unit – IV	**Economic Regions:** Agricultural Regions of the World; Industrial Regions of the World; Micro Agro-Industrial Regions of USA, Japan and China.
Unit – V	**Regional Planning and Development:** Important concepts, approaches and methods of Regional Development and their application with special reference to Uttarakhand

Books Recommended:

1. English, Paul Ward & Miller, J.A, .World regional Geography: A Question of Place, John Wiley, New York, 1989
2. Jaclspm. R.H. & Hadman L.E., World Regional Geography: Issue for today, J John Wiley, New York, 1991
3. Blij, H. Muller, O., Geography, regions and Concepts, John Wiley, New York,1993

4. Don, R.H.(ed.),	Essential of Geography and Development, McMillan, New York, 1980
5. Mead, W.R.,	The United States and Canada
6. White,	Regional Geography of Anglo-America
7. Jones and Bryan,	North America
8. Watson, J.W.	North America
9. Dury, G.H. & Methieson, R.,	The United States and Canada
10. Gregory and Sheawe,	Geography of The U.S.S.R.
11. Turin,	The U.S.S.R.
12. Shoad, T.,	Geography of the U.S.S.R.
13. Robinson, H.,	The U.S.S.R.
14. Lydoloph,	Geography of the U.S.S.R.
15. Stampand Beaver,	The British Isles
16. Mackinder,	Britain and British Isles
17. Unstead,	The British Isles
18. Watson and Tissions,	The British Isles
19. Trewartha,	Japan
20. Fisher, C.A.,	South East Asia
21. Dobby,	Monsoon Asia
22. Stamp, L.D.,	Asia
23. Fisher, C.A.,	South East Asia
24. Laborde,	Australia, New Zealand and Pacific Islands
25. Taylor,	Australia
26. Stamp, L.D.,	Africa
27. Shahman,	South America
28. Saklani,P.S.(ed.),	Tectonic Geology of the Himalaya, 1978
29. Singh, R.L.,	India: A Regional Geography, 1971
30. Nityanand & K.Kumar,	The Holy Himalaya
31. Valdiya, K.S,.	Land and People, 1988
32. Bose, S.C.,	Land and People of the Himalaya, Calcutta,1968
34. Singh O.P.(ed.),	The Himalaya: Nature, Man and Culture, 1983
35. Joshi, S.C. et.al,	Kumaun Himalaya, Nainital, 1983
37. Joshi, S.C.,	Uttaranchal: Environment & Development

SEMESTER – II

Code : 206 (GMP-EC - iii)

BASES OF HYDROLOGY

Paper – Fourth (c)

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit – I	**Conceptual Base:** Concepts and scope of hydrology, hydrology in relation to water resources development, hydrological cycle .
Unit – II	**Water and its Disposition:** Hydrological properties of rocks and water types found in them. Recharge and discharge of ground water, Types of aquifer.
Unit – III	**Underground Hydrosphere:** Structure of the underground hydrosphere, Vadose and phreatic Zones, Underground water classification.
Unit – IV	**Ground Water Movements:** Hydraulic conductivity, Darcy's law, Permeability, Transmissibility, Concept of artificial recharge.
Unit –V	**Flow Measurements and Hydrograph:** Rivers : Channel flow measurement, Hydrograph analysis; Surface water resources of India.

Books Recommended:

1. Chorley, R.J. (ed.) (1969) : Water Earth and Man, Methuen, London.
2. Dakshinamurthy, et.al. (1973) : Water, Resources of India and Their Utilization in Agriculture, IARI, New Delhi.
3. Rawat,J.S. and Joshi Joshi (ed) (2013):Environmental Hydrology, Gyanodaya Prakashan Nainital.
4. Rwat,J.S. (1993): Forest Influence on Hydrological Parameters, National Institute of Hydrology, Roorkee.
5. Govt. of India, Ministry of Agriculture (1972), Report of the Irrigation Commission, Vol. 1 to IV, New Delhi.

6. Govt. of India, Ministry of Agriculture (1974), Report of National Commission on Agriculture, Parts IV &V, New Delhi.
7. Govt. of India, Ministry of Energy and Irrigation (Dept. of Irrigation, 91980), Rashtriya Barh Ayog, Report- National Commission on Floods, Vol. I & II.
8. Gregory, K.J. and Walling De (1973)) : Drainage Basin Form and Processes, Edward Arnold, London.
9. Jackson, P.J. (1977) : Climate, Water and Agriculture in the Tropics, London.
10. Law, B.C. (ed.) (1968) : Mountains and Rivers of India, 21, G.C. National Committee for Geography, Calcutta.
11. Linslay, R.K. et.al. (1958) : Hydrology for Engineers, Mc Graw Hill.
12. Rao, K.L. : India's Water Wealth, Orient Longman.
13. David Knighton (1984) : Fluvial Forms and Processes, Edward Arnold, London.

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SEMESTER – II

SEMESTER – II

Code: 207 (GMP - CCm –i): DISSERTATION (MINOR)

Total Marks Allotted for Dissertation	: 25
Evaluation by External Examiner	: 10
Evaluation by Internal Examiner	: 10
Viva – Voce Examination (by both the examiners)	: 05

Problem Oriented Work Based Dissertation

The students will be required to select the topic and area with the help of their respective supervisors allotted to them by the Department. Dissertation must be submitted to the Department one week before the commencement of the Theory Examinations. The size of the dissertation should normally range between 30 and 40 pages. The Dissertation will be evaluated by a panel of examiners appointed by the Convener of BOS, Geography. The evaluation and viva –voce examination will be conducted by both the external and internal examiners.

SEMESTER – II

Code : 208 (GMP - CCm–ii): SEMINAR/ PRESENTATION

Total Marks : 25

The students will be required to select any one of the topics allotted them by the Department. The Topic will be related to the disciplines already studied by students in the same semester as core or elective courses. The assessment of the presentation of the students/examinees will be done by external and internal examiners appointed by the Convener/Head of the Department/University.

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SEMESTER – II

PRACTICAL

Code: 209 & 210 (GMP - P-i & P-ii): BASIC REMOTE SENSING AND CARTOGRAPHIC REPRESENTATION OF GEOGRAPHICAL DATA (Pi); AND FIELD SURVEY (Pii)

Term End Exam	: Marks	:	60	Time: 04 Hours
Record Work	: Marks	:	10	
Viva - Voce	: Marks	:	10	
Field Survey	: Marks	:	20	(Local Field Survey will be organized in the supervision of Teachers nominated by the Department).
Total Marks	**:**		**100**	

Unit – I	Sampling Theories: Basic concepts of probability. Test of significance: 't' test, Chi square test.
Unit – II	Measures of dispersion: Variability, Range, Mean deviation, Quartile deviation, Standard deviation, Karl Pearson's Co-efficient of Correlation, Spearson's rank correlation method. Regression analysis.
Unit – III	Nature and Scope and Development of Cartography; Cartographic representation of geographical data by (a) dots (b) proportional squares and (c) circles methods.
Unit – IV	Representation of climatic data: Climatograph, climograph, hythergraph and water balance graph.
Unit – V	Components of Satellite Remote Sensing; Remote Sensing Platforms and Sensors; Stereoscopic Test; Process of Satellite Remote Sensing.; Aerial Photo Interpretation.

Books Recommended:

1. Singh, R.L. & Singh, R.P.B. Elements of Practical Geography (English & Hindi)
2. Singh,L.R. & R.Singh Mapwork and Practical Geography (Hindi & English)
3. Misra, R.P. & A.Ramesh Fundamental of Cartography, New Delhi, 1986
4. Monkhouse, F.J. Maps and Diagrams, Methuen, London, 1971
5. Robinson, A.H. Elements of Cartography
6. Raise, E. Principles of Cartography

7. Birch, T.W.	Maps: Topographical and Statistical
8. Garnett, A.	A Geographical Interpretation of Topographical Maps
9. Derk, C.L. & Brown, U.S.	Interpretation of Topographical and Geological Maps
10. Goopson &Morris	A Contour Dictionary
11. Holmes	Practical Map Reading
12. Gregory, S.	Statistical Methods and the Geographers (Hindi & English
13. Toyne & Newby	Techniques in Human Geography
14. Agrawal, C.S. & Garg,P.K.	Textbook on Remote Sensing, Wheeler, 2000
15. Cracknell,A.P.	Introduction to Remote Sensing, T.& F. London, 1990
16. Curran, P.J.	Principles of Remote Sensing, Longman, 1985
17. Star, J. and Estes,J.	GIS-An Introduction , Prentice Hall, 1990
18. Mark, S. Monmorier	Computer_ Assisted Cartography, Prentice Hall,1982

SEMESTER – III

Code : 301 (GMP-CCM – i)

ENVIRONMENTAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

Paper – First

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit – I	**Conceptual Base:** Environment: Concepts and Types; Environmental Perception; Environment and Society; Meaning, Scope and Significance of Environmental Geography; Approaches to the Study of Environmental Geography.
Unit – II	**Environmental Problems:** Types of environmental problems; causes and consequences of environmental problems at global regional and local levels; Global environmental change; Natural disasters; Environmental Impact Assessment (EIA).
Unit – II	**Sustainable Development:** Concepts of Sustainable Development; Need of Sustainable Development; Sustainable Mountain Agriculture and Livelihood.
Unit –IV	**Environmental Management:** Concept of Environmental Management; Approaches to Environmental Management; Integrated Watershed Management; Disaster Management
Unit – V	**Environmental Management in Uttarakhand Himalaya:** Environmental Changes – Causes & Consequences; Environmental Planning & Sustainable Development; Disaster Management; Climate Change and Adaptation

Books Recommended:

1. Ahmad,Y.J., G.K. Sammy (1985): Guidelines to EIA in Developing Countries. Hordder & Stoughton, London.

2. Brundland, G. (1988) Our Common Future, Report of the World Commission on Environment and Development, UN.

3. Carpenter R A (ed) (1983):Natural Systems for Development: what planners need to known. Mc. Millan London.

4. Cheremisinoff, P.N. & A.C. Morresi (1977): Environment Assessment and Impact studies Handbook. An Arbor, Mich: Anarbor Science.

5. Wathern, Peter (1986): Enviromental Impact Assessment: Theory and Practice. Unwin & Hyman, London.

6. Pande G.C. & D.C. Pandey (1999) : Environmental Development and Management: Strategies and Policies (ed.), New Delhi.

SEMESTER – III

Code :302 (GMP-CCM-ii)

AGRICULTURAL GEOGRAPHY AND AGRO- ECOSYSTEM MANAGEMENT

Paper – Second

Term End Exam. Marks	: 75	Time: 03 Hours
Internal Assessment Marks	: 25	(20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)
Total Marks	**: 100**	

Unit –I	**Concepts:** Definition, Nature, scope, Significance of Agricultural Geography, Approaches to the study Agricultural Geography, Agricultural Land Use and Location Theories
Unit – II	**Agricultural Types:** Agricultural types and their world distribution, Subsistence Agriculture, Commercial farming, Plantation agriculture, Mixed agriculture, State, Collective and Cooperative farming, Spatial patterns of major commodities in each type.
Unit – III	**Techniques of Agricultural Regionalization:** Quantitative Techniques and methods in Agricultural Geography for measuring Agricultural Intensity, Agricultural Efficiency, Concentration and Diversification of Crops, Methods of delimitation of crop Combination and Agricultural regions. Whittlesey's classification of Agricultural regions of the world.
Unit – IV	**Agricultural Ecology and Ecosystem:** Agro-ecosystem – connotation, components , types and functioning, agro-ecosystem degradation with special reference to Himalaya, Agro- ecosystem and agro- energy environment Management.
Unit – V	**Planning and Management: Regional Perspective:** Problems of agriculture and agricultural planning in India, salient features of agricultural development of Uttarakhand Himalaya and their management and planning.

Books Recommended:

1. Bhalla, G.S. and Alagh, Y.K. (1979) performance of India, agriculture: a district-wise study, sterling, New Delhi.
2. Das, M.M. (1982) Peasant Agriculture in Assam, Inter India, New Delhi.
3. Gobind, N. (1986) Regional perspective in agriculture, concept, New Delhi.
4. Hussain, M. (1979) Agricultural Geography, Inter India, New Delhi.
5. Mergra, W.B. & Munton, R.J.C. (1971) Agricultural Geography, methuen, London.
6. Mitchel, P. (1979) Agro-ecosystem, Inter India Publication,New Delhi
7. Shafi, M. (1984) Agricultural Productivity and Regional Imbalance, Concept, New Delhi.
8. Singh J. & Dhillon, S.S. (1985) Agricultural Geography, Tata McGraw Hill, New Delhi.
9. Singh, J. (1974) Agricultural Atlas of India: A Geographical perspective, Vishal Publications, Kurukshetra.
10. Morgan, Agricultural Geography.
11. Alexander, J.W., Economic Geography.
12. Thomas, R.S.,The Geography of Economic Activity.
13. Gregor, Howard, F., Geography of Agriculture: Themes in Research.
14. Russel, J.,World Population and World Food Supplies.
15. Stamp, L.D.,Our Developing World.
16. Sykes, F., Food Farming and Future.
17. Courtnay, P.P., Plantation Agriculture.
18. Egher and Heady,Regional Adjustment in Grain Production.
19. Sauer, Carl O.,Agricultural Origins and Dispersals,
20. Randhawa, M.S., Indian Agriculture.
21. Page, W.G., Origins of Agriculture
22. Bireshwar Banergee (ed), Agricultural Geography.
23. Padam Singh Jhina, Agriculture in the Hill regions of North India.
24. Singh, B.B., Krishi Bhoogol (in Hindi).
25. Tiwari, R.C. & Singh,B.N., Krishi Bhoogol, Prayag Pustak Bhawan, Allahabad.
26. Kumar, Pramila, Krishi Bhoogol, Madhya Pradesh Hindi Granth Academi, Bhopal.
27. Howard Greor, Geography of Agriculture, P.Hall, 1967.

28. Singh, J. (1974) Agricultural Atlas of India: A Geographical Perspective Kurukshetra.
29. Wathern, Peter, Enviromental Impact Assessment: Theory and Practice.
30. Unwin & Hyman, London. 1986.
31. Brundland, G., Our Common Future, Report of the World Commission on Environment and Development, UN , 1988.

SEMESTER – III

Code : 303 (GMP-CCM-iii)

RURAL DEVELOPMENT PLANNING

Paper – Third

Term End Exam. Marks	: 75	Time: 03 Hours
Internal Assessment Marks	: 25	(20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)
Total Marks	**: 100**	

Unit – I	**Fundamental Base:** Meaning, concept and scope of Rural Development and Planning: Basic elements of Rural Development, Growth versus Development, Approaches to Rural Development, Development and change
Unit – II	**Dimensions of Rural Economy:** Size, Structure and characteristics of Rural Economy, The role of agriculture And non-agricultural sub sectors, Concept and measures of rural poverty, Rural Industrialization.
Unit – III	**Paradigm of Rural Development:** The dependency theory of Marxist School, Gunner Myrdal's thesis of spread and backwash effects, The Gandhian model of Rural development, Changing Paradigm of Rural development.
Unit – IV	**Rural Development Programmes in India:** Community Development Programmes and Panchayati Raj, Integrated Rural Development Programmes, special groups, MAGNREGA and area specific programmes, drought prone, desert development.Mountain and tribal development programmes in India.
Unit – V	**Planning for Rural Development:** Rural Development Policies in India. Levels and functions of Rural Planning, methods of micro level planning in agriculture, Block and District level planning. People's participation in Rural Planning.

Books Recommended:

1. Boudeville, J.R. (1966) problems of Regional Economic Planning, Edinburgh University Press Edinburgh.

2. Bunge, W. (1966) Theoretical Geography, Lund Studies in Geography Series, CI, Lund, Gleerup.

3. Cheema, G.S. and Rondinelli, D.A. (1983) Decentralization and Development: Policy Implementation in Developing Countries, Sage, Beverly Hills.

4. Chenery, H. et. al. (1974) Redistribution with Growth, Oxford University Press, Oxford.

5. Darwent, D.F. (1969) 'Growth poles and growth centres in regional planning: a review, Environment and Planning, 1 (1), 5-31.

6. Frank,A.G. (1981) Crisis in the Third World, heineman, London.

7. Tolmer, H. and Oosterhaven, J. (eds.) (1979), Spatial Inequalities and Regional Development, Nijhoff, leiden.

8. Forbes, D. (1982) Geography of Under-development, Croom Helm, London.

9. Friedmann, J. and M. Douglass 91978) Agropolitan Development: Towards a new strategy for regional planning in Asia in Lo, Fu-chen and K. Salih (eds.) Growth Pole Strategy, Pergamon, London.

10. Gilbert, A. (ed.) (1976), Development Planning and Spatial Structure, John Wiley, London.

11. Hagerstrand, T. (1967) Innovation Diffusion as a Spatial structure, John Wiley, London.

12. Hall, P. (1975) Urban and Regional Planning, David and Charles, London.

13. Harvey, P. (1982), The Limits to Capital, Bsil Blackwell, Oxford.

14. Hilhorst, J.G.M. (1971) Regional problems, Macmillan, London.

15. Johnson, E.A.J. (1970), The Organization of Space in Developing countries, Harvard University press, Cambridge, Mass.

16. Kitching, G.N. (1982) Development and Under-development in Historical perspective: Population, Nationalism and Industrialization, methuen, London.

17. Kuklinski, A (1975) Regional Disaggregation of National policies and Plus, Monton, paris.

18. Lo, Fu-Chen and Salih, K. (eds.) (1978), Growth Pole Strategy and Regional Development Policy, Pergamon, Oxford.

19. Lipton, M. (1977) Why people Stay Poor: a study of urban bias in world development, Temple Smith London.

20. Massey, D. (1984) Spatial Division of Labour, Macmillan, London.

21. North D.C. (1955): Location theory and regional economic growth, Journal of Political Economy, 63 (3) 243-58.

22. Olsson, G. (1974): the Chalectics of spatial analysis. Antipode, 6, 50-62.

23. Leoyd and Dicken (1972): Location in Space- A Theoretical Approach to Economic Geography, Haper Brothers.

24. Singh, O.P. & Pandey, D.C. (1986): Development Planning: Theory and Practice, Nainital.

25. Chorley, R.J.(1967): Water Earth and Man, Methuen, London.

26. Abler & Others: Spatial Organization, The Geographer's View of the World (Pentice, New Jersey)

27. Lalit Sen and Others: Planning Rural Growth Centres for Integrated Areas Development: A Study in Kiryalauda Taluka, Hyderabad.

28. Herinansen: Spatial Organization and Econimic Development, Scope and Task of Spatial Planning (University of Mysore, 1971).

29. Prakasa Rao, V.L.S. : Regional Planning, New Delhi.

30. Freeman: Geography and Planning.

31. Misra, R.P., K.V.Sundaram& V.S.L.Prakash Rao (1974): Regional Development Planning in India, Vikas Publication, Delhi.

32. Pandey,D.C.& Tiwari, P.C. (eds.)(1989) : Dimensions of Development Planning, in two volumes, Delhi.

SEMESTER – III

Code : 304 (GMP-EC-i)

CLIMATE CHANGE, IMPACTS AND ADAPTATION IN HIMALAYA

Paper – Fourth (a)

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit –I	**Elements of Climate:** Nature and Scope and Relationship with other Sciences; Understanding Climate Change; Concept of Climate Change; Global Trends of Climate Change; Assessment of Climate Change over mountains.
Unit – II	**Trends of Climate Change in Himalaya:** Himalaya as Climate Change Hot Spot; Trends of Climate Change in Himalaya: Rainfall, Temperature and Extreme Weather Events.
Unit – III	**Climate Change Induced Natural Disasters:** Understanding Linkages between Climate Change and Natural Disasters; Droughts and High Intensity Rainfall and their impacts on natural environment, society and economy
Unit – IV	**Climate Change Vulnerability and Risk**: Concept of Vulnerability and Risk; Assessment of Climate Change Vulnerability and Risk; Upstream-downstream linkage of Climate Change
Unit – V	**Climate Change Adaptation in Himalaya:** Concept of Climate Change Adaptation; Types of Climate Adaptation; Role of Local Institutions in climate Change Adaptation; Mainstreaming Climate Change Adaptation and Disaster Risk Reduction into Development Planning; Community Based Climate Change Adaptation.

Books Recommended:

1. P. Wester, A. Mishra, A. Mukherji, A. B. Shrestha (eds), The Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability and People, Springer Nature Switzerland AG, Cham. pp., 2019
2. World Bank, South Asia's Hotspots Impacts of Temperature and Precipitation Changes on Living Standards, Report Preview Spring 2018, World Ban Group, Washington D.C. 2018
3. S. Irudaya Rajan, R. B. Bhagat eds, Climate Change, Vulnerability and Migration, Routledge, India, 2018
4. M.S.S. Rawat et al. (eds), Environment, Resources and Development of the Indian Himalaya, Transmedia Publication, Srinagar, Garhwal, Uttarakhand, India, 2018
5. Tor H. Aase, Climate Change and the Future of Himalayan Farming, Oxford University Press, 2017

6. Velma Grover et al.(eds), Global Change and Mountains: Consequences, Responses and Opportunities, Science Publishers, CRS Press, Taylor and Francis, USA, 2015
7. E. Grohmann et al. (eds), Environmental Deterioration and Human Health: Natural and Anthropogenic Determinents, Springer, Dordrecht, 2014
8. Ning, Wu; Rawat, G.S.; Joshi, S.; Ismail, M.; Sharma, E. (Eds) High-altitude rangelands and their interfaces in the Hindu Kush Himalayas. Kathmandu: ICIMOD, 2013
9. Jean Palutikof et al. (eds.) Climate Adaptation Futures, Wiley Publishing Company, U.K., 2013
10. C. Margottini et al. (eds), Landslide Science and Practice, Vol. 4, Springer-Verlag, Berlin, Heidelberg, Germany, 2013
11. Velma Grover (ed) Impact of Climate Change on Water and Health, CRC Press, Taylor and Francis Group, 2013
12. G. Rasul and M. Karki (eds) Policy Priorities for Sustainable Mountain Development, Kathmandu: International Center for Integrated Mountain Development, 2008
13. Huddlestone, B., Ataman, E. and d'Ostlanl, L. F., Towards a GIS-based analysis of mountain environments and populations, FAO, Rome, 2003
14. ICIMOD, Mountains of the world: ecosystem Services in a Time of global and climate change: seizing opportunities meeting challenges Framework paper prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Ministry of Environment
15. IPCC, Climate change: Impacts, adaptation, and vulnerability, Part A: Global and sectoral aspects, Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Summary for policymakers, Cambridge University Press, Cambridge, United Kingdom and New York, USA, 2014
16. Tse-ring, K., Sharma, E., Chettri, N., Shrestha, A. (eds), Climate change vulnerability of mountain ecosystems in the eastern Himalayas. Climate change impact on vulnerability in the eastern Himalayas-synthesis report. Kathmandu: ICIMOD, 2010
17. M. Beniston, Environmental change in mountains and uplands. London, 2000.
18. Food and Agricultural Organization, Food Security in Mountains – High time for action. Brochure of the International Mountain Day 2008. http://www.mountaineering.ie/documentbank/uploads/IMD08%20brochure.pdf
19. Food and Agricultural Organization, International Year of the Mountains. Food and Agriculture Organisation of the United Nations, Rome, 2002.
20. Food and Agricultural Organization, Land-water linkages in rural watersheds. Land and Water Bulletin 9. Food and Agriculture Organisation of the United Nations, Rome, 2002
21. Martin J. Haigh, Headwater control: integrating land and livelihoods, paper presented at the International conference on Sustainable Development of Headwater Resources. United Nation's International University, Nairobi, Kenya, September, 2002.
22. ICIMOD, Mountains of the World –Ecosystem Services in a Time of Global and Climate Change: Seizing Opportunities – Meeting Challenges. Framework paper prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Ministry of Environment, 2010
23. ICIMOD, The Changing Himalayas: Impact of Climate Change on Water Resources and Livelihoods in the Greater Himalayas. ICIMOD, Kathmandu, Nepal, 2009
24. IPCC, Climate change 2007: The scientifi c basis. Working Group I contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report. Cambridge: Cambridge University Press, 2007

25. IPCC, Climate Change: Impacts, adaptation and vulnerability. Working Group II contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report. Cambridge: Cambridge University Press, 2007
26. Messerli, B. and Ives, J. D. (eds), Mountains of the world – A global priority. A contribution to Chapter 13 of Agenda 21. New York: Parthenon, 2007
27. Aguado, E. Burt, J.E. (2001): Understanding Weather and Climate, Prentice Hall of India Pvt. Ltd, New Delhi.
28. Trewartha, G.T. and Horn, L.A. (1980): An Introduction to Climate, Mc Graw Hill, New York.

SEMESTER – III

Code :305 (GMP-EC-ii)

SOCIAL AND CULTURAL GEOGRAPHY

Paper – Fourth (b)

Term End Exam. Marks	: 75	Time: 03 Hours
Internal Assessment Marks	: 25	(20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)
Total Marks	**: 100**	

Unit – I	**Fundamental Base:** Nature, scope, and significance of Social and Cultural Geography: Definitions of Society, social plurality, culture, cultural types, cultural divergence and cultural convergence.
Unit – II	**Evolution Theories:** Geographical Factors in India's Social Evolution; Theories of evolution of races, Physical characteristics & early patterns, migration and distribution.
Unit – III	**Socio-cultural Groups:** Evolution of later social and cultural groups: religions and languages, Socio-cultural diversity in India and in the world.
Unit – IV	**Socio-cultural Regionalization:** Components of social diversity; tribes and their distribution; Tribal regions of India; Cultural regions in India: elements of cultural regionalization: race, caste, dialect, language, religion.
Unit – V	**Regional Perspectives:** The Indian tribal groups; Race, language, distribution and cultural adaptations; Impact of globalization and social transformation in India.

Books Recommended:

1. Ahmad, Aijazuddin (1999) : Social Geography, Rawat Publication, New Delhi.
2. De Blij, H.D. : Human Geography, John Wiley and Son, New York.
3. Dreze Jean and Amartya Sen (1996) : Economic Development and Social Opportunity, Oxford University Press, New Delhi.
4. Dubey, S.C. (1991) : Indian Society, National Book Trust, New Delhi.
5. Gregory, D. and J. Larry (eds) (1985) : Social Relations and Spatial Structures, McMilan.
6. Haq. Mahbulbul : Reflections on Human Development : Oxford University Press, New Delhi.
7. Maloney, Clarence (1974) : People of South Asia, Winston, New York.
8. Planning Commission (1981) : Report on Development of Tribal Areas, Government of India.
9. Rao, M.S. A. (1970) : Urban Sociology in India , Orient Longman.

10. Schwartzberg, Joseph (1978) : An Historical Atlas of South Asia, University of Chicago Press, Chicago.
11. Sen, Amartya and Dreze Jean (1996) : Indian Development : Selected Regional Perspectives, Oxford University Press.
12. Smith, David (1977) : Geography : A Welfare Approach, Edward Arnold, London.
13. Sopher, David (1980) : An Exploration of India, Cornell University Press.
14. Subba Rao (1958) : Personality of India : Pre and Proto Historic Foundation of India and Pakistan, M.S. University, Baroda, Vadodara.
15. Gritzer, Charles, F. : The Scope of Cultural Geography, Journal of Geography, V. 65, 1966. pp. 4-11.
16. Jordan, Terry, G. and Rowutree Lester: The Human Mosaic: A Thematic Introduction to Cultural Geography.
17. Thomas, W.L. : Man's Role in Changing the Face of the Earth, Chicago, 1956.
18. Wagner, P.L. and Mikesell, M.W. (ed.) : Readings in Cultural Geography, Chicago,1962.
19. Risley, H. : The People of India – Delhi, 1969.
20. Bshme, A.L. : The Wonder That was India.
21. Brace, C.L. : The Stages of Human Evolution.
22. Butimer, A. : Values in Geography.
23. Chatterjee, A.B. : Social Geography.
24. De Bliz, H.G. : Human Geography – Culture, Society and Space.
25. Dicken and Pitts : Introduction to Cultural Geography.
26. Ghurey, B.S. : Caste and Class in India.
27. Guha, B.S. : Racial Elements in India's Population.
28. Hagget, P. : Geography – A Modern Synthesis.
29. Harris , K.D. : The Geography of Crime and Justice.
30. Jones, Emrys and Eyles, John : An Introduction to Social Geography.
31. Morril, R.L. : The Spatial Organisation of Society.
32. Raza, M. and Ahmad, A. : Tribal Atlas of India.
33. Ruth, N. and Dandekar, V.M. : Poverty in India.
34. Singh, K.S. : Tribal Situation in India.
35. Spencer, J.E. and Thomas, W.B.: Cultural Geography.
36. Sundaram, K.V.: Geography of Poverty.
37. Furer – Haimendorf, C.V. (1989): Tribes of India: Struggle for Survival, OUP, Delhi.
38. Furer – Haimendorf, C.V. (1990): Life Among Indian Tribes: The Autobiography of an Anthropologist, Oxford, New York.
39. Mann, R.S. and Mann, K. (1989): Tribal Cultures and Change, Mittal, New Delhi.

SEMESTER – III

Code : 306 (GMP-EC - iii)

GLACIAL GEOMORPHOLOGY

Paper – Fourth (c)

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit – I	**Theoretical Base:** Definition of Glacial Geomorphology; Ice Age; Causes of ice ages; Pleistocene Glaciation; onset and retreat.
Unit – II	**Erosional Proceeses and Landforms:** Erosional process; glacial erosion, development of erosional landforms; superglacial, englacial and basal .
Unit – III	**Depositional Proceeses and Landforms:** Deposional processes: processes-stratified and non stratified; forms of moraines-glaciofluvial and glacio-lacustrine environment.
Unit – IV	**Periglacial Processes:** Periglacial process: frozen ground phenomenon –identifical ,depth variations, classification and distribution; mechanism of frost action.
Unit – V	**Periglacial Landforms:** Periglacial landforms;frost action and landforms-mass wasting and landforms, adaptation of human beings to periglacial environment.

Books Recommended:

1. Brown,R.J.E, Permafrost in Canada. University of Toronto Press,Toronto,1970
2. Carson MA. And kirkby M.J., Hillslope form and Process, Cambridge University press,1972
3. Coates,D.R. (ed) Glacial Geomorphology. State University of New York,1974, New York,1974

4. Dixon, J.C. and Abrahams, A D (eds),: Periglacial Geomorphology. John Wiley new York,1992.
5. Drewry,D., Glacial Geological Processes, Edward Arnold, London,1986.
6. Embleton,C. and Thormes,J. (rds), Process in Geomorphology, Arnold-Hesnemann, New Delhi,1980.
7. Embleton,C and king, C.A.M., Glacial and periglacial Geomorphology, Edward Arnold, London,1968.
8. Hails, J R (ed), Applied Geomorphology, Elsevier Sci. Amsterdam,1977.
9. Pewe,T.L. (ed): The periglacial Environment. Mc. Gill-Queen's University press, montreal 1969.
10. Peterson, W.S.B., The physics of Glacials. Pergamon press, oxford 1969.
11. Price,L.W., The periglacial Environment, Permafrost and man., Commission on College Geography, Resource Paper no. 14, Washington, D.C. 1972.
12. Ritter, D.F. Craig, R. and Miller, J.P., Process of Geomorphology., W.C Brown Dubuque, 1995.
13. Slymaker, O.(ed0, Steepland Geomorphology.,John Wiley, London,1995.
14. Sugden,D.E. and John, B.S. Glaciers and landscape. Edward Arnold, London,1976.
15. Vander veen, c. J., Fundamentals of glacier Dynamics., A.A. Balkemma, Rotterdam, 1999.
16. Wright, A E and Mosley, p. (eds), ice ages: ancient and Modern., Seel house press, Liverpool, 1975.

SEMESTER – III

Code: 307 (GMP - CCm –i): DISSERTATION (MINOR)

Total Marks Allotted for Dissertation	:	25
Evaluation by External Examiner	:	10
Evaluation by Internal Examiner	:	10
Viva – Voce Examination (by both the examiners)	:	05

Problem oriented work based Dissertation

The students will be required to select the topic and area with the help of their respective supervisors allotted to them by the Department. Dissertation must be submitted to the Department one week before the commencement of the Theory Examinations. The size of the dissertation should normally range between 30 and 40 pages. The Dissertation will be evaluated by a panel of examiners appointed by the Convener of BOS, Geography. The evaluation and viva –voce examination will be conducted by both the external and internal examiners.

SEMESTER – III

Code: 308 (GMP - CCm–ii): SEMINAR/ PRESENTATION

Total Marks : 25

The students will be required to select any one of the topics allotted them by the Department. The Topic will be related to the disciplines already studied by students in the same semester as core or elective courses. The assessment of the presentation of the students/examinees will be done by the external and internal examiners appointed by the Convener/Head of the Department/University.

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SEMESTER – III

PRACTICAL

Code: 309 & 310 (GMP - P-i & P-ii): SURVEYING AND MAP PROJECTION(Pi); AND FIELD SURVEY (Pii)

Term End Exam	: Marks	:	60	Time: 4 hrs
Record Work	: Marks	:	10	
Viva - Voce	: Marks	:	10	
Local Field Survey	: Marks	:	20	(Regional Field Survey will be organized in the supervision of Teachers nominated by the Department).
Total Marks	:		100	

Unit –I	Nature, Principles and types of Surveying; Surveying with the help of prismatic compass.
Unit – II	EDM, and Leveling with Dumpy level.
Unit – III	Contouring and determination of heights with Indian Pattern Clinometer
Unit –IV	Map Projection: Meaning and classification; Principles, merits, demerits.
Unit –V	Construction (with emphasis on mathematical/ trigonometrical methods) and use of the following projections: Gall's, Mercator's, Bonne's, Polyconic, International Mollweilde's - main and interrupted, Sinusoidal- main and interrupted, Gnomomic, Stereographic and Orthographic Zenithal Projections.

Books Recommended:

1. Bygott, G.L. : Mapworks and Practical Geography.
2. Mahmood, Aslam (1977) : Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
3. Mishra, R.P. and Ramesh, A. (1969) : Fundamentals of Cartography, Concept Publishing Company, New Delhi.
4. Singh, R.L. and Singh Rana, P.B. (1991) : Elements of Practical Geography, Kalyani Publishers, Ludhiana.
5. Singh, L.R. and Singh, R. (1991): Mapwork and Practical Geography, Central Book Depot, Allahabad.
6. Wilkinson, H.R. and Monkhouse, F.J. (1952) : Maps and Diagrams, B.I. Publications Pvt. Ltd., New Delhi.

SEMESTER – IV

Code : 401 (GMP-CCM-i)

ADVANCED GEOGRAPHY OF UTTARAKHAND

Paper – First

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit – I	**Physical Background:** Geo-environmental background: Geology, Physiography, climate, drainage, Soils, flora and fauna, Natural and Bio-geographic Regions.
Unit – II	**Population and Settlements:** Population and Human Resource Development; Spatial Patterns, Structure, Composition and Dynamics of Population; Tribal Groups and their Spatial Distribution, Fairs Festivals and Languages and Dialects, Settlements: Types and Patterns
Unit – III	**Agricultural Development:** Agricultural Characteristics and Trends; land holdings; Land Reforms; Cropping Pattern; Irrigation; Farm Technology; Agricultural Productivity and Agricultural Regions; Impact of Green Revolution; Horticultural and Floriculture Development including medicinal and aromatic plants.
Unit – IV	**Mineral and Energy Resources and Industries:** Major Mineral Deposits: Distribution and Production, Energy Resources: Development of Hydro- electricity, Industries: Localization and Spatial Distribution, Principal Industries of the region, Industrial Regions, Trade, Transport, Tourism and forestry, Potentials and Prospects,
Unit – V	**Future Prospects and Development Plans**: Development under Five Year Plans, Sustainable Development Plan for Uttarakhand Himalaya, Environmental Hazards and Management in Uttarakhand Himalaya.

Books Recommended

1. Valdiya, K.S. **:** Land and People, 1988
2. **:** Bose, S.C.: Land and People of the Himalaya, Calcutta,1968
3. Singh O.P.(ed.) : The Himalaya: Nature, Man and Culture, 1983
4. Joshi, S.C. et.al : Kumaun Himalaya, Nainital, 1983
5. Singh,O.P. & Pande,R.K.: Human Habitat in the Mountain (1998)
6. Joshi, S.C.: Uttaranchal: Environment & Development, 2001
7. Saklani,P.S.(ed.): Tectonic Geology of the Himalaya, 1978
8. Singh, R.L.: India: A Regional Geography, 1971
9. Nityanand & K.Kumar : The Holy Himalaya

SEMESTER – IV

Code : 402 (GMP-CCM - ii)

POPULATION GEOGRAPHY AND HUMAN RESOURCE DEVELOPMENT

Paper – Second

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit – I	**Fundamentals of Population Geography:** Meaning, Nature, Scope and Significance of Population Geography, Methods, Techniques and Approaches of Population Geography. Population Geography and Demography; Human Resource Development and Population Explosion, Population Theories: Malthusian, Neo-classical & Marxist.
Unit – II	**Population Data:** Sources of Population Data; History of Census, Census Data Structure; Methods and Techniques of Mapping Population Data
Unit – III	**Demographic Traits:** Measures and methods of estimating fertility and mortality; Population composition: age, sex, literacy, occupation, caste and tribe; Population Growth and Distribution: World patterns and Indian Growth Trends. Determinants of population distribution, The great human agglomerations, population cycle, population growth and its consequences; Population densities; population pressure; concepts of under, optimum and over-population.
Unit – IV	**Human Migration:** Types of migration, causes and consequences of migration; Growth and migration theories, Rural and urban population, population movements: International and internal causes and consequences of migration,
Unit – V	**Population Projection and Planning:** Typology of population regions with special reference to India, The balance of people and resources; population resource regions; population projection; population potential and dispersion, population education and Human Resource Development planning.

Books Recommended:

1. Clarke, John I. Population Geography
2. Wilson, M.G.A. Population Geography

3. Bose, A.	Patterns of Population change in India, 1951-61
4. Zelinsky, W.	A Prologue to Population Geography
5. Woytinsky, S.N. & Woytinsky, E.W.I.	World Population and Production
6. United Nations	The Determinates and Consequences of Population Trends
7. Hauzer, P.M. et al.	Study of Population: Inventory and Appraisal
8. Smith T. Lynn	Fundamentals of Population Study
9. Clarke, John I.	Population Geography and Developing Countries
10. Garnier, J. Beaiyeu	Geography of Population
11. Demko et al.	Readings in Population Geography
12. Trewartha, Glen T.	A Geography of Population : World Patterns, 1969
13. Trewartha, G.T.	The Less Developed Realm : A Population Geography
14. Russel, Sir John	World Population and World Food Supplies
15. Chandrashekher, S.	Hungry People and Empty Land
16. P.E.P.(ed.)	World Population and Resources
17. Agrawal, s.N.	India's Population: Some Problems in Perspective Planning
18. Census of India	Reports, Various Year
19. United Nations	Year Book & Reports
20. Chandra, R.C.	(i) Geography of Population, Kalyani, 1986 (ii) Population, Kalyani, 1999

21. UNDP,UNEP & UN's Current Report on Human Resource Development
22. Bhendea A. and Kanitkar, T. (1985) : Principles of Population Studies, Himalaya Publishing House, Mumbai.
23. Chandra, R.C. and Sidhu, M.S. (1980): Introduction to Population Geography, Kalyani Publishers, Ludhiana.
24. Clorke, J.L. (1972) : Population Geography, Pergamon Press, Oxford.
25. Demko, G.J. and Rose, H.M. and Schnell, G.A. (1979): Population Geography: A Reader, Mc Graw Hill, New York.
26. Dubey, R.M. (1981): Population Dynamics in India, Chugh Publications, Allahabad.
27. Mandal, R.B., Uyanga, J. and Prasad, H. (1989): Introductory Methods in Population Analysis, Concept, New Delhi.
28. Sundaram, K.V. and Nangia, S. (1985): Population Geography, Heritage, and New Delhi.

SEMESTER – IV

Code :403 (GMP-CCM-iii)

BIOGEOGRAPHY

Paper – Third

Term End Exam. Marks	: 75	Time: 03 Hours
Internal Assessment Marks	: 25	(20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)
Total Marks	**: 100**	

Unit -I	**Fundamental Concepts:** Concept, Scope, Significance and Development of Biogeography; Environment, Habitats and Plant-animal Association.
Unit -II	**Plant Geography & Plant Succession:** Elements of Plant Geography, Distribution of Forests and Major Plant Communities. Plant successions in newly formed landforms. Examples from flood plains and glacial fore fields.
Unit - III	**Zoogeography & Biodiversity:** Zoogeography and its environmental relationship; Physical factors influencing world distribution of animals and their actual world distribution; classification & distribution of animals; faunal regions; biomes and their types; Bio-diversity and its depletion through natural and man-induced causes.
Unit - IV	**Climate Change: Temporal Perspectives:** Paleo botanical and Paleo climatological records of environmental Changes. Impact of Climate Change on Flora and Fauna with special reference to Uttarakhand Himalaya.
Unit - V	**Biotic Resource Management:** National Forest and Wildlife Policy of India. Conservation of biotic resources. Bioinformatics, Protected Areas and their management with special reference to National Parks, Wildlife Sanctuaries and Biosphere Reserves of Uttarakhand.

Books Recommended:

1. Agarwal, D.P. (1992) : Man and Environment in India Through Ages, Books and Books.
2. Bradshaw, M.J. (1979): Earth and Living Planet, ELBS, London.
3. Cox, C.D. and Moore, P.D. (1993): Biogeography: An Ecological and Evolutionary Approach, 5th Edn., Blackwell.
4. Gaur, R. (1987): Environment and Ecology of Early Man in Northern India, R.B. Publication, Corporation.
5. Hoyt, J.B. (1992): Man and the Earth, Prentice Hall, U.S.A.
6. Hugget, R.J. (1998): Fundamentals of Biogeography, Routledge, U.S.A.

7. Illies, J. (1974): Introductory to Zoogeography, Mcmillan, London.
8. Khoshoo, T.N. and Sharma, M. (eds.) (1991): Indian Geosphere – Biosphere Har – Anand Publication, Delhi.
9. Lapedes, D.N. (ed.) (1974) : Encyclopedia of Environmental Science, McGraw Hill.
10. Mathur, H.S. (1998) : Essentials of Biogeography, Anuj Printers, Jaipur.
11. Pears, N. (1985) : Basic Biogeography, 2nd Edn. Longman, London.
12. Simmon, I.G. (1974) : Biogeography, Natural and Cultural, Longman, London.
13. Tivy, J. (1992) : Biogeography : A Study of Plants in Ecosphere, 3rd Edn., Oliver and Boyd, U.S.A.
14. Tiwari, P.C. and Bhagwati Joshi (1997): Wildlife in the Himalayan Foothills of Uttar Pradesh: Conservation and Management, New Delhi.

SEMESTER – IV

ANNEXURE - II

[REVISED COURSE FRAMEWORK]

Code: 404 (GMP-EC-i)

INTEGRATED WATERSHED MANAGEMENT

Paper – Fourth (a)

Term End Exam. Marks	: 75	Time: 03 Hours
Internal Assessment Marks	: 25	(20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)
Total Marks	**: 100**	

Unit-I	**Concept of Watershed:** Understanding Watershed; Concept; Watershed Perimeters; Characteristics and Functioning of Watershed.
Unit-II	**Watershed Approach:** Watershed Approach and its Rationale; Significance of Watershed Approach in Mountain Development.
Unit-III	**Climate Change Adaptation and Disaster Management at Watershed Level**: Mainstreaming Climate Change Adaptation and Disaster Risk Reduction in Integrated Watershed Management; Watershed Level Early Warning System for Flood Risk Mitigation.
Unit-IV	**Trans-boundary Watershed Management in Himalaya:** Upstream-Downstream Linkages; Significance of Trans-boundary Watershed Governance.
Unit-V	**Integrated Watershed Management:** Concept and Scope; Natural resource Management at Watershed Level; Participatory Watershed Management; Integrating Social and Economic Development in Watershed Management.

Books Recommended:

1. Centre for Science and Environment, New Delhi, The State of India's Environment-Citizens Report, Centre for Science and Environment. (CSF), New Delhi, 1982
2. Valdiya, K.S.; Environmental Geology: Indian Cntext, T.M.H., New Delhi, 1987.
3. Dassman, R.F.; Environmental Conservation, John Wiley & Sons, New York,1976
4. P. Wester, A. Mishra, A. Mukherji, A. B. Shrestha (eds), The Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability and People, Springer Nature Switzerland AG, Cham. pp., 2019
5. M.S.S. Rawat et al. (eds), Environment, Resources and Development of the Indian Himalaya, Transmedia Publication, Srinagar, Garhwal, Uttarakhand, India, 2018

6. Velma Grover et al.(eds), Global Change and Mountains: Consequences, Responses and Opportunities, Science Publishers, CRS Press, Taylor and Francis, USA, 2015
7. G. Rasul and M. Karki (eds) Policy Priorities for Sustainable Mountain Development, Kathmandu: International Center for Integrated Mountain Development, 2008
8. Huddlestone, B., Ataman, E. and d'Ostlanl, L. F., Towards a GIS-based analysis of mountain environments and populations, FAO, Rome, 2003
9. ICIMOD, Mountains of the world: ecosystem Services in a Time of global and climate change: seizing opportunities meeting challenges Framework paper prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Food and Agricultural Organization, Food Security in Mountains – High time for action. Brochure of the International Mountain Day 2008. http://www.mountaineering.ie/documentbank/uploads/IMD08%20brochure.pdf
10. Food and Agricultural Organization, International Year of the Mountains. Food and Agriculture Organisation of the United Nations, Rome, 2002.
11. Food and Agricultural Organization, Land-water linkages in rural watersheds. Land and Water Bulletin 9. Food and Agriculture Organisation of the United Nations, Rome, 2002
12. Martin J. Haigh, Headwater control: integrating land and livelihoods, paper presented at the International conference on Sustainable Development of Headwater Resources. United Nation's International University, Nairobi, Kenya, September, 2002.
13. ICIMOD, Mountains of the World –Ecosystem Services in a Time of Global and Climate Change: Seizing Opportunities – Meeting Challenges. Framework paper prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Ministry of Environment, 2010
14. Messerli, B. and Ives, J. D. (eds), Mountains of the world – A global priority. A contribution to Chapter 13 of Agenda 21. New York: Parthenon, 2007
15. Valdiya, K.S.; Environmental Geology: Indian Cntext, T.M.H., New Delhi, 1987.

SEMESTER – IV

Code : 405 (GMP-EC - ii)

GIS AND GPS APPLICATIONS

Paper – Fourth (b)

Term End Exam. Marks : 75 Time: 03 Hours

Internal Assessment Marks : 25 (20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)

Total Marks : 100

Unit – I	**Geography and Geographical Information System:** Geography as a spatial science; Basic concepts of GIS; Components & Elements of GIS. Map Characteristics: Geo-referencing, Scale, Map Resolution; Map Projections, Data Automation; Types of Information in a Digital Map; Attribute Information; Display Information; Layering.
Unit– I	**Geographical Data Sets:** Geographic Data Types; Spatial and Non-spatial data; Linkages and Matching, Principal Functions of GIS; Data Capture; Geographic Analysis; Scanning System; Data Conversion; Data Base and Spatial Data Management; Geo-Relational Data Model; Topological Data Structure; Attribute Data Management; Relational Database - Concepts & Model.
Unit– I	**Global Positioning System:** Basic Concepts; GPS - Components and Basic Facts; Components of a GPS; GPS Positioning Types; Accuracy of GPS; Reference station; GPS Applications.
Unit– I	**GPS Applications:** Application of GPS in resource mapping, Map Updating, Cadastral Mapping, Micro Level Surveying etc.
Unit– I	**GIS Applications:** Application of GIS in Geographical studies with special reference Natural Resource Management, Urban Management, Environmental Management, Agricultural Planning, Emergency Response System and Decision Support System.

<u>Books Recommended</u>:

1. Aroneff, S. Geographic Information System: A Management Perspective, DDL Publication, Otawa, 1989

2. Burrough,P.A. University	Principles of Geographic Information System for Land Resources Assessment, Oxford Press, New York, 1986
3. Fraser Taylor, D.R.	Geographic Information System, Pergamon Press Oxford, 1991
4. Maquire, D.J.M.F. Goodchild	Geographic information Systems: Principles and Application, Taylor & Francis, Washngton, 1991 and D.W. Rhind (eds.)
5. Mark S. Monmonier	Computer-assisted Cartography- prentice Hall, Englewood Cliff, New Jersey
6. Peuquet D.J. & D.F.Marble	Introductory Reading in Geographic Information System, Taylor & Francies, Washngton, 1990
7. Star J. and J.E. Estes	Geographic Information Sytems : An Introduction: Prentice Hall, Engleweed Cliff, New Jersey,1994

SEMESTER – IV

Code : 406 (GMP- EC – iii)

DISASTER MANAGEMENT

Paper – Fourth (c)

Term End Exam. Marks	: 75	Time: 03 Hours
Internal Assessment Marks	: 25	(20 Marks allotted for Internal Assessment by Submitting Two Assignments for Evaluation & 05 marks for attendance and overall performance in the class.)
Total Marks	**: 100**	

Unit – I	**Fundamentals of Disaster Management:** The significance of disaster, Disaster threat, National disaster management policy, Major requirements for coping with disaster, Disaster and disaster management cycle,
Uni t – II	**Long term Measures:** Prevention, Mitigation, Preparedness, Disaster and development, Disaster legislature, Counter disaster resources, Disaster management plans, Utilization of resources.
Unit – III	**Response to Disaster Impact:** Response; Search, Rescue and Evacuation, Logistic; Incident command system.
Unit – IV	**Major Post impact Factors:** Recovery, Post disaster review and damage assessment, Relief, Rehabilitation and Restructuring
Unit – V	**Regional Pattern of Disaster Management:** International disaster assistance, Leadership in disaster, Organization, Disaster scenario of Uttarakhand, Disaster management system in Uttarakhand.

SEMESTER – IV

Code: 407(GMP - CCm –i): DISSERTATION (MAJOR)

Total Marks Allotted for Dissertation	:	75
Evaluation by External Examiner	:	25
Evaluation by Internal Examiner	:	25
Viva – Voce Examination (by both the examiners)	:	25

The students will be required to select the topic and area with the help of their respective supervisors allotted to them by the Department. Dissertation must be submitted to the Department one week before the commencement of the Theory Examinations. The size of the Dissertation normally range between 60 and 70 pages. The Dissertation will be evaluated by the external and internal examiners as stated above. The viva –voce examination will be conducted by both the examiners.

SEMESTER – IV

Code: 408 (GMP - CCm–ii): SEMINAR/ PRESENTATION

Total Marks : 25

The students will be required to select any one of the topics allotted them by the Department. The Topic will be related to the disciplines already studied by students in the same semester as core or elective courses. The assessment of the presentation of the students/examinees will be done by the external and internal examiners appointed by the Convener/Head of the Department/University.

SEMESTER – IV

PRACTICAL

Code: 409 & 410 (GMP - P-i & P-ii): GIS, GPS, QUANTITATIVE TECHNIQUES & SPATIAL ANALYSIS (Pi) AND FIELD SURVEY (Pii)

Term End Exam.	: Marks	:	60	Time: 04 Hours
Record Work	: Marks	:	10	
Viva - Voce	: Marks	:	10	
Field Survey	: Marks	:	20	(Local Field Survey will be organized in the supervision of Teachers nominated by the Department).
Total Marks	:		100	

Unit –I	Theodolite Surveying - Measurement of horizontal and vertical angles, Triangulation survey.
Unit – II	Use of Telescopic Alidade, Use of Abney level and Sextant (determination of heights and distances)
Unit – III	Basic concepts of GIS; Components of GIS; Elements of GIS. Fundamentals of GIS; Basic Concepts of GPS - Components and Basic Facts; Components of a GPS.,Base Map Preparation.
Unit – IV	Techniques for spatial pattern of distribution: Choropleth, Isopleth and Chorochromatic maps.
Unit – V	Measurement of Spatial Patterns of Distribution: Nearest Neighbour analysis; scaling techniques, rank score, weighted score & Z-score, shape analysis, Gravity Model; Network Analysis: Topologic Structure, Branching, Circuits and Barrier Networks.

Books Recommended:

1. Hinks : Map and Surveying
2. Jameson & Ormsby : Mathematical Geography, vol.I &II
3. Threlfal : A text Book of Surveying
4. Tracy : Surveying : Theory and Practice
5. Davis, R.E. : Elementary Plane Surveying
6. Kanetkar, T.P. :Surveying and Levelling
7. Kellawey : Map Projection
8. Steers : Introduction to Map Projection

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