Doon University, Dehra Dun

M.A./M.Sc. Geography

COURSES OF STUDY

UNDER CHOICE BASED CREDIT SYSTEM

(CBCS)

Doon University, Dehra Dun

M.A./M.Sc . Geography

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UNDER CHOICE BASED CREDIT SYSTEM

(CBCS)

Duration : 2 years
Level : P.G.
Type : Degree
Eligibility : Graduation and Equivalent

M.A./M.Sc . Geography is P.G. Geography course . Minimum time to complete the course is two years .

Eligibility :

- The candidate should have minimum 50 % marks in B.A / B.Sc . with Geography
- However , for admission to M.Sc. in Geography a candidate must also have offered geology / chemistry / statistics / Maths / and others as one of the subjects at the Graduate level along geography .

Some of the reputed Universities and Institute demand minimum 30 % marks in graduation as qualifying criteria to secure admission in this course and conduct entrance examination to get admission to their M A / M Sc (Geog) degree course . Selection to the degree course in these universities is based on marks secured in the final merit ie total marks aggregates in the final exam of graduation and the entrance exam.

The master programme in Geography of the Doon University comprises 16 courses spread over two years. Each course has a maximum of 100 marks. The two years has four semesters of six months each semester, student will have four courses. Out of the 16 courses, 12 courses are compulsory covering core areas and 4 courses are optional leading to specialization. Optional courses are in third and fourth semesters. In third and fourth semester candidate will opt two out of the 12 optional courses in contemporary branch of geography. The Department will decide the courses that would offer.

In all the semester each practical shall consist of 100 marks (25 +75) . Final practical consists of 75 marks and remaining 25 marks consist of internal assessment in each semester. Practical in each semester shall be conducted by internal and external examiners at the centre. Dissertation is compulsory in third semester Research topic and supervisor will be appointed by the Head le charge

of the department. The dissertation will be examined for 50 marks by the external (outside the University) and internal examiners both . Remaining 25 marks are allowed to the presentation and Visa - Voce exam of the candidate to be jointly evaluated by the supervisor and external examiner. Candidate must pass in theory and practical examinations separately obtaining at least 50 % marks in each paper.

Course Curriculum: M. A / M.Sc. Geography

Summary of Course Structure

Number of Theory Papers	16 (12 core couses + 04 Elective Course)
Number of Practical's	04 (one in each semester)
Field Tour and Survey Camp	02 (Ist and 3rd semester)
Dissertation Minor	03 (Ist, 2nd and 3rd semester)
Dissertation Major	01 (4th semester)
Total Credits	93
Total Duration	Four semesters (2 years)

Distribution of Semester - Wise Credits and Marks

semester	Total		Theory		Practical				Dissertation		Seminar presentation	
					Lab work		Field work					
	Credit	Marks	Credit	Marks	Credit	Marks	Credit	Marks	Credit	Marks	Credit	marks
First	23	575	16	400	3	75	1	25	2	50	1	25
Second	23	575	16	400	4	100			2	50	1	25
Third	23	575	16	400	3	75	1	25	2	50	1	25
Fourth	24	600	16	400	4	100			3	75	1	25
total	93	2325	64	1600	14	350	2	50	9	225	4	100

First semester
Paper 1
Advanced Geomorphology
Code:SLE 101

Unit	contents
Unit I	**Concepts , Methods and Techniques** Nature , Scope and significance of geomorphology . Methods and approaches to the study of landforms , Fundamental geomorphological concepts as given by W. Thornbury , Systems approach in geomorphology, Trends in Geomorphology study.
Unit II	**Tectonics and Slope Sculpture** Isostasy , Plate tectonics and mega - land forms , Mountain building . Structural land forms , Inversion of relief , Mass - movement - classification , factors governing and resultant landforms . Material of the Earth crust-Rocks
Unit III	**Landform Theories and Models** Theories of landscape development by G Gilbert . W.M. Davis , W.Penck , J.T. Hack , and L.C. King . Polycyclic landscape , Morphogenetic landscape evolution regions . Techniques of geomorphological mapping . Rates and pattern of landscape evolution
Unit IV	**Geomorphologic Processes** Glaciation , Glacial and glacio - fluvial landforms . Peri - glacial processes and landforms ; Fluvial processes and landforms : River basins as geomorphic unit , Drainage patterns and systems . Morphometry of drainage basins , Development of Valley Profile . Graded curve - profile equilibrium , channel forms and pattern , denudation theories of slope development slope measurement.
Unit V	**Applied Geomorphology** Geomorphic Hazards . Geomorphology in Civil Engineering : Application of geomorphology in planning and resource Management . Anthropogenic and Technocratic processes in geomorphology . Landforms of Garhwal Region.

Books Recommended :

1. Bloom , A.L. (1978) : A Systematic Analysis of late Cenozonic Landforms , Englewed York .
2. Condle , K.C. (1989) : Plate Tectonics and Crustal Evolution . Pergamon Press . New
3. Chorley , R.J. (ed .) : Spatial Analysis in Geomorphology , London , Metheun . Unwin , London .
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 Management , Oxford University Press ,
6. Cooke , R.U. and J.C. Doornkamp (1974) : Geomorphology in Environmental
7. Embleton , C. and J. Thornes : Processes in Geomorphology , London , Edward Arnold . University Press , London , 1974 ,
8.Garner , H.F .: The Origin of Landscape - A Synthesis of Geomorphology , Oxford And Hyman .

9. Goudie , A. (ed .) (1990) : Geomorphological Techniques . London , George Unwin Unwin , London .
10. Hart , M.G. (1986) : Geomorphology : Pure and Applied , George Allen.
11. Holmes , A .: Principles of Physical Geology , 3-4 Edn . London . Nelson . 1978 .
12. King , C.A. M .: Techniques in Geomorphology : London : Edward Amold .
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 - Verlag
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 .
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 .

First semester
Paper 2
Geographic Thought
Code:SLE 102

Unit	contents
Unit I	**Geography - Its Nature and concepts** Geography as a scientific discipline , methods and approaches Geography as the study of areal differentiation Man - environment relationship , and spatial organization . The measure of significance in geography , Time and genesis in Geography : Development of Dualism in Geography- Physical Dualisms . vs. Human Geography , Systematic vs. Regional Geography ; other dualisms
Unit II	**Development of Geographical Thoughts** Evolution of geographic knowledge since the classical times - contributions made by Greeks , Romans Egyptians Indians & Chinese . Geography geography during the Dark Age : Contributions of Arab Scholars ; Renaissance in Geography
Unit III	**The Formation of Modem Geography** The beginning : Thought of Varenius and Kant ; General Course of geographic thought in the Second half of the 19th Century and in the first half of the 20th century : Contributions made by German French . British . American and Russians - Analysing the works and ideas of the main exponents : Humboldt , Ritter , Richthofen , Ratzel & Hettner , Blache & Brunhes Mackinder & Herbertson ; Semple . Huntigton & Karl Saur Lomonosov & Gerasimov ,
Unit IV	**Development since Early Fifties** Quantitative Revolution ; Quantification and statistical analysis in geography - Its role and main reactions to it : Development of Models and Paradigms in geography - uses , objectives and types of models , Systems theory in geography ; Locational spatial analysis and Spatial Organizations
Unit V	**Recent Conceptual Development** Philosophical issues in scientific methods : Positivism and Logical Positivism in Geography : Perception , and Behavioural geography , and Humanistic geography ; and geography of place , Gender , Inequality and Development, Recent development and changes in indian geography and its future. Modern techniques and concepts in geography; remote sensing, systems approach and geographic information system.

Books Recommended :

1. Hartshome , 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 of Geography : London , 1956)
9. Wooldridge The Geographer as Scientist , essays on the scope and nature
10. Board and Others Progress in Geography , Voll 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 Wooldridge
22. Stamp , L.D. & London Essays in Geography , 1951
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 , Chaitanya 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

First semester
Paper 3
Regional Geography of India
Code:SLE 103

Unit	contents
Unit I	**Physical Aspects** Geological history , physiographic divisions , drainage system , climate including origin and mechanism of the Indian monsoon , New Theory of Monsoon , Nino impact on the climate .. Climatic division , Distribution and types of soils and natural vegetation.
Unit II	**Demographical Aspects : Rural and Urban** 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 . Cultural linguistic zones . Target human - groups and their problems- Tribals and scheduled castes , People of Hill and migration .
Unit III	**Economic Aspects ; Agricultural Power / and Minerals** Agricultural regionalization - A - climatic regions , Crop intensity . Cropping pattern and crop combination . Agricultural productivity and efficiency in India , Green revolution and other agro proactive revolutions Agricultural land use policy in India sources and extent - of irrigation in different parts of India . Power generation and utilization : Major - river valley projects Mineral zones of India .
Unit IV	**Industrial Regions** Industrial development . Types of industry study of mineral - based , agro based and forest - based industries , household industry , engineering and other demand - based industries , new industrial policy , Industrial regionalization . Study of the transport network development : roadways , railways , airways and waterways , policies and problems ; International Trade - trends and direction
Unit V	**Geographical Regions of India** Regional planning, Planning regions of India: Multilevel planning. Different types of regions, Geographical regions of India: Detailed regional study of Chhota Nagpur , Bastar region . Malabar Coast. Meghalaya region, Kashmir region, thar region.

Books Recommended :

1. Spate & Learmonth India and Pakistan
2. Singh , R.L.Jed .) India , A Regional Geography
3. Tiwari , R.C. Geography of India , Allahabad , 2003
4. Gopalakrishnan R. Geography of India , Jawahar Publishers Gyanodaya Pr . , Gorakhapur.2003
5. Singh , Jagdish India : A Comprehensive Systematic Geography , Publication , 1968

6. Sen Gupta , P. Economic Regionalization of India , Census of India India Publication , 1967
7. Mitra , Ashok Levels of Economic Development of India , Census of Economic Research
8. National Council of Applied Technology - 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) . Bansal , S.C. , Bharat Ka Bhugol . Minakshi Publication , Meerut .

First semester
Paper: 4a
Climatology and climate change
Code:SLE 104a

Unit	contents
Unit I	**Fundamentals of Climatology** Meaning , Nature and Scope ; relationships with meteorology and with other sciences ; Elements of climate . Structure of atmosphere and its characteristics ; Solar radiation and terrestrial heat balance ; humidity and precipitation .
Unit II	**Atmospheric Processes** Atmospheric pressure , Air masses , fronts and associated atmospheric disturbances (cyclogenesis and cyclolysis) ; concepts and methods of determining evaporation ; evapotranspiration and moisture indices ; physiological climatology , Micro - climatology .
Unit III	**Climate Types** Climatic Classification : Thronthwaite's , Koeppen and Geiger's ; Regional Climatology : Tropical climates , mid latitude climates , polar and highland climates , monsoon , Mediterranean and desert climate.
Unit IV	**Climate Change : Responses & Adaptation** Climatic Changes : Theories and Evidences of Paleo - Climates , global warming ; ozone depletion ; Variation in Precipitation Pattern ; Impacts of Climate Change and Adaptation Strategies .
Unit V	**Applied Climatology** Applied climatology with special reference to sources and analysis of Indian climate ; Detailed study of Indian monsoon . Cloud burst .

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 , University , Nainital
9. Rao , M.S.A. (1970) : Urban Sociology in India , Orient Longman Geography Master's Programme (MA / MSc) Semester Course Framework of Geography , Komin 42 Chicago Press , Chicago .
10. Schwartzberg , Joseph (1978) : An Historical Atlas of South Asia , University of Perspectives , Oxford University Press .

11. Sen , Amartya and Dreze Jean (1996) : Indian Development Selected Regional
12. Smith , David (1977) : Geography : A Welfare Approach , Edward Amold , London .
13. Sopher , David (1980) : An Exploration of India , Comell University Press India and Pakistan , M.S. University , Baroda , Vadodara .
14. Subba Rao (1958) : Personality of India : Pre and Proto Historic Foundation of India and Pakistan, M.S. University, Vadodara.
15. Gritzer , Charles , F .: The Scope of Cultural Geography , Journal of Geography.
16. Jordan , Terry , G. and Rowutree Lester : The Human Mosaic : A Thematic
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 ,
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.

First semester
Paper: 4b
Agricultural Geography
Code:SLE 104b

Unit	contents
Unit I	**Meaning and Concept** Nature , scope and significance of agricultural geography : approaches to the study of agricultural geography . Modern concepts of agriculture ; physical and cultural factors of dispersal ; Types of Farming & agriculture.
Unit II	**Agricultural Land Use** Determinants of agricultural land use ; Physical , economic . socio - cultural , institutional and technological factors of agricultural dynamics . Land use types , land - holding , land - tenure system etc .: Von Thunen's theory of agricultural location and its recent modifications ; land use survey in the world with special reference to Britain & India .
Unit III	**Distribution of Soil and Means of Irrigation** Soil properties and land capability classification ; measurements of agricultural efficiency and productivity ; efficiency & cropping intensity ; Potential land and landuse planning : Agricultural infrastructures , modem farm technology and inputs ; Irrigation system . Green and other revolutions .
Unit IV	**Types and Methods** Agricultural typology ; Crop association and crop combination regions - based on minimum deviation method . Weaver's method . Doi's method . least square method & maximum positive deviation method ; Cropping pattern Crop concentration and diversity ; Crop mixing and rotation .
Unit V	**Agricultural Regions** Whittlesey's agricultural classification types & War pattern with special reference to U.S.A ... Parameters and characteristics of agricultural regions of Agricultural scenario of India ; Post - revolution Indian agriculture ; Uttarakhand and management planning .

Books recommended:

1. Symons , T. : Agricultural Geography
2. Jakob , J. ; Agricultural Geography
3. sauer , Carl : Agricultural Origins Dispersal
4. Gregory , H.F. : Geography of Agriculture Themes in Research
5. Tarrent , J.R. : Agricultural Geography
6. Singh , Jasbir : Agricultural Atlas of India

7. Hussain , M. : Agricultural Geography
8. Ali , Mohammad : Dynamics of Agricultural Development in India
9. Banerji , B. (ed .) : Essays on Agricultural Geography
10. Tiwari . P.S. (ed .) : Agricultural Geography
11. Singh . B.B. : Krishi Bhoogol (Hindi
12. Kumar . P. & Verma . S.D. : Krishi Bhoogol (Hindi).

First semester
Paper: 4c
Rural Development and Planning
Code:SLE 104c

Unit	contents
Unit I	**Meaning and Concept** Definition , nature , scope and significance of settlement geography : Approaches to Rural Development , Evolution of Settlement studies in geography . Concept and Contents ; Human Settlement as a systems . Rural urban dichotomy
Unit II	**Evolution and Pattern of Settlements** Origin , evolution of Indian villages & their relationships in different regions . Spatial components of rural settlements - size , spacing , shape , site arrangement pattern and their relationship - Indian context ; distribution of rural settlements in different geographical environs : Types and patterns of rural settlements their characteristics , special reference to the Himalaya .
Unit III	**Morphology of Settlement** Settling processes - sites and evolution of rural settlements ; spatio - temporal dimensions Morphology of rural settlements with special reference to India . Functions and functional taxonomy of rural settlements : Rural settlements and spatial organization ; Rural service centres and growth foci - nature
Unit IV	**Rural Development Programmes in India :** The Gandhian model of Rural development Community Development Programmes and Panchayati Raj . Integrated Rural Development Programmes , special groups , P. M. Awash Yojana and area specific programmes , Slums and their problems , Mountain and tribal development programmes in India .

Unit V	**Policy and Planning** Rural Settlement Planning in India , Policies & Programmes related to Rural Development in India . Methods of micro level planning . Block and District level planning .

Books Recommended:

1. Hudson , F.S. : A Geography of Settlements
2. Money , D.C. : Patterns of Settlements
3. Wanmali , S. : Service Centres in Rural India
4. Singh , R.L. et . al . (eds .) : Readings in Rural Settlement Geography
5. Singh , RL . et.al. (eds .) : : Rural Settlements in Monsoon Asia
6. Mandal , R.B. : Introduction to Rural Settlements.

First semester
Paper 5
Practical (cartography)
Code:SLE 105

Unit	contents
Unit I	**Map Projections** Construction , Characteristics and Uses of Map projections ; Polyconic , International , Gall's Equatorial cases of Gnomonic and Stereographic projections , Interrupted Sinusoidal and Interrupted Mollweides Projections , UTM Projection and Marcater's Projection .
Unit II	**Interpretation of Topographical Maps** Significance of map . Index system , Grid reference , Map reading Component of topographical map- scale , direction , symbols , coordinates , direction , distance e Identification of land forms . Interpretation of land use , drainage and settlements pattern Study of any two topographical sheets , one hill and one plain .

Unit III	**Relief Features and Slope Analysis** Depiction of relief : Contours and contouring from spot heights ; Altimetric frequency curve , block diagrams (one point perspective) Slope and gradient , relief profiles , methods of slope analysis (e.g , Wentworth's , Rare & Henery method & Smith's methods) construction of longitudinal and transverse profiles
Unit IV	**Interpretation of Geological Maps** Geological Maps and their Interpretation ; Folded and faulted structures , effect of relief on the sequence and pattern of rock outcrops .
Unit V	**Drainage Morphometric Analysis** Drainage Analysis : Ordering . Density , Frequency , Longitudinal Profiles , Graded profile . Hypsometric Curve .

Books Recommended :

1. Robinson , AH . et al . : Elements of Cartography
2. Steers , J.A : An Introduction to the Study of Map Projections
3. Barrett , E.C. & Courtis , L.F .: Introduction to Environmental Remote Sensing
4. Dickinson , G.C. : Maps and Aerial Photographs
5. Smith , H.T.V. : Aerial Photographs and Their Applications
6. Deekshatulu , B.L. , & Rajani Y.S.: Remote Sensing.

SEMESTER - 1

DISSERTATION (MINOR)

Code : SLE 106

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

SEMINAR / PRESENTATION

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 .

Second semester
Paper 1
Geography of Natural Resources
Code:SLE 201

Unit	contents
Unit I	**Basic Framework** Meaning , Scope and Approaches to Resource Geography , Main Concepts of Economic Geography, Concept of Resources related to man nature and culture , Dynamic concept of resources , Classification of resources
Unit II	**Distribution Patterns of Natural Resources** Land , Soil , water , minerals , agriculture , energy resources and their world distribution . Biotic resources and Biotic succession ; Biomes of the world , Functioning of ecosystem . Use and misuse of resources . Problems of energy crises
Unit III	**Economic Regionalization** Agricultural Regions of the World (Derwent Whittlesey) . Theory of Agricultural Location (Von Thunen) , Theory of Industrial Location (Weber) , Major Industries : Iron & Steel , Textiles , Petro- Chemical & Sagar . Industrial Regions of the World . Resource regions . Industrial regions of the world (Great Lake Region Industrial Belis - of Japan - Ruhr basin and Ukrain)
Unit IV	**World Transport Network** Major Trans - Continental Railways , Sea & Air Routes , International Trade Patterns & Trend , Major Trade . Blocks : NAFTA , EEC , ASEAN , Effect of Globalization on Developing Countries.
Unit V	**Management of Natural Resources :** Utilization of natural resources , Concept and Approaches of natural resource management , People's participation and shared decision making in natural resource management . Role of R S and GIS techniques for the assessment of natural resources.

Books Recommended :
1. Hartshom . T.A. & Alexander , J.W. Economic Geography , 3sedn . , 1994
2. Boesch , Hans A Geography of World Economy
3. Fryer , D.W. World Economic Development
4. Gregor , H.F. Environment and Economic Life : An Economic and Social Geography
5. Highsmith , R.M. (r .) Case Studies in World Geography
6. Hoffman , L.A. Economic Geography
7. Zimmerman , E.W. World Resources and Industries , Harper and Row , London , 1951
8. Stringer , A. Davis A Geography of Resources
9. Zones and Darkenwold Economic Geography
10. Mccarty & Lindberg An Introduction to Economic Geography
11. Miller , E.W. A Geography of Manufacturing
12. Whate , C.L. Criffin , P.E. & , Economic Geography Mc Knight T.L.

13. Russel , J. World Population and Food Supplies
14. Hoover , E.M. The location of Economic Activity
15. Isard , W. Location and Space Economy
16. Stuart Mudd The Population Crisis and the Use of the World Resources
17. Russel Smith Industrial and Commercial Geography
18. Chishom Commercial cography Geography
19. Eengston and Royen Fundamentals of Economic Geography
20. Janaki , V.A. Economic
21. Guy , Harold Smith Conserving Natural Resources : Principles & Practice
22. Kates , W. & Firey W. (ed) Man , Mind and Land : A Theory of Resource Use
23. Perloff , H.S. & Others Resources and Economic Growth
24. Barlowe , R. Land Resource Economics
25. Zinnerman , E.W. Introduction to World Resources
26. Singh , K.N. & Singh.J . Arthik Bhoogol Ke Mool Tatwa (in Hindi)
27. Odum , E.P. Fundamentals of Ecology . W.B. Sanders , Philadelphia , 1971
28. Park , C.C. Ecology and Environmental Management , Butterworths , London , 1980
29. Paul , R.E. et.al Ecoscience : Population , Resource and Environment , W.H. Freeman , Sanfrancisco , 1977
30. Smith , R.L . Man and his Environment : An Ecosystem Approach , Harper and Row , London , 1972
31. Southwich , Charles (ed .) Global Ecology , Sunderland , Massachusetts , 1985
32. Strahler , A. Geography and Man's Environment . John Wiley , New York , 1977 Paul Knox , John Agnew , Linda McCarthy , The Geography of the World Economy , Oxford University Press , USA .

Second semester
Paper 2
Fundamentals of Remote Sensing and GIS
Code:SLE 202

Unit	contents
Unit I	**Meaning & Concept of Remote Sensing (RS)** Process and stages of Remote sensing . Electromagnetic Radiation (EMR) Interaction of EMR with the Earth surface & atmosphere . Types of Platforms Basic principles of Thermal & Microwave Remote Sensing , infrared (TR) Region of EMR , Characteristics of IR Images and their use , Radar Image Characteristics , Advantages of Radar Imagery .
Unit II	**Aerial Photo – Interpretation** Aerial photographic Systems & Methods : Classifications ; Factors of Photo image & quality ; scale & Resolution ; Maps & air photos . Photogrammetry - Geometry of aerial photographs . Stereoscopic vision , Till Relief & Image Displacement : Fundamentals of Air photo - interpretation Factors & Elements of Image Interpretation .
Unit III	**Digital Image Processing** Types of Image , Digital form of data , Digital Processing Techniques , Digital image classification . Computer fundamentals of Remote sensing Remote Sensing Programme in India .
Unit IV	**Geographic Information System (GIS)** Meaning , scope & concepts , History & development , Elements of GIS : GIS Software . Types of data , data models and structure , Representation of spatial and non - spatial Information , Data Input Methods Data Base , Remote Sensing & Data integration
Unit V	**Recent Trends of GIS** Internet GIS , Virtual 3 - D GIS , Digital Elevation Model (DEM) , GPS System & application, computer(assisted) cartography, application of GIS in Geomorphology, land-use planning and urban settlement analysis.

Books Recommended :

1. Avery . T.E. :Introduction to Aerial Photographs
2. Leuder, R.D.: Aerial Photographic Interprctation
3. Van Zuidam , RA .: Guide to Geomorphological Photo - Interpretation
4. Sabine , F.F.: Remote Sensing - Principles & Interpretations
5. Jensen , J.R: : Introductory Digital Image Processing - A Remote sensing perspective.
6. Lillesand , RM . & Kiefer . RW .: Remote Sensing & Image Interpretation

7. Deckshatulu , B , L . & Ranjan , Y.S. (eds): Remote Sensing
8. Demers , M.N. Laurini , R. & Thomson , D. :Fundamentals of Geographic information system
9. Martin , D.S. : Geographic information system: socio-economic applications
10. Aronoff , S. : Geographic Information Systems- A management perspective.
11. Jones , C : Geographic Information Systems and cartography .

Second semester
Paper 3
Geography of the Himalayan Mountain
Code:SLE 203

Unit	contents
Unit I	**Origin of the Himalaya** Geo - physical identity of the Himalaya , Location , Extent Himalyan orogeny and Neo-techtonic, Structural division of the Himalaya.
Unit II	**Physical Aspects :** Physical divisions , Relief , Drainage , Glaciers , Lakes , Landforms the Himalaya . Climate , Vegetation , Bio - diversity , Natural Hazards , Environmental degradation in the Himalaya.
Unit III	**Regional Classification** Regional divisions of the Himalaya , Regionalization III macro . meso and micro regions . Parameters and Characteristics . Salient Characteristics of each region.
Unit IV	**Cultural Aspects** Population density , growth , and distribution , Settlement IV Urbanization . Tribal and Pastoral communities , Agriculture , Animal husbandry . Horticulture , Transport and Tourism , Power Projects , Implications of out - migration on the regional economy and problems of waste land expansion.
Unit V	**Development and Planning** Geographical account of Kashmir, laddak, Lahul and Spiti Doon valley Kathmandu Valley – Dhiyang valley and Tista valley Mountain development Planning and Policy , Future prospects of development in the Himalaya .

Books Recommended :

1. Lall , J.S. & Moddie , A.D. (eds) : The Himalaya -Aspects of Change .

2. Bose . S.C. : Land and People of the Himalaya ..
3. Kayastha , S.L.: The Himalayan Beas Basin
4. Valdiya , K.S. (ed .) : Kumaun - Land and People .
5. Singh . T.V. (ed .): Mountain and Development
6. Singh . O. P. (ed .):The Himalaya - Nature , Man & / Culture .

Second semester
Paper 4
Practical (Computer, Remote Sensing and GPS)
Code:SLE 204

Unit	contents
Unit I	Basics of computer , Coordinate system , UTM projection , World global system (WGS) . Import and export of file , Geo - referencing (map to image and image to map) Re sampling.
Unit II	Digitization (point , line and polygon) . Sub setting with AOY layer . Mosa Radiometric and Geometric errors and correction Image classification.
Unit III	Spatial data and Non spatial data integration . Editing of data . Building topology , Image interpretation , Interpretation keys , Raster and Vector.
Unit IV	Aerial Photo Interpretation : Stereo test card vision testing . Stereo visic basics of aerial photographs . Fiducial marks , tilt , mosaic . Types of air photographs , Identification of features and mapping.
Unit V	Basic Concepts of GPS - Components and Basic Facts ; Components of GPS , Practical mapping of GPS of marks Practical.

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

Second semester
Paper 5a
Oceanography
Code:SLE 205a

Unit	contents
Unit I	**Basic of Oceanography** Meaning objectives , scope and significance of oceanography, Plate tectonics , Ocean floor spreading
Unit II	**Marine Topography** Submarine relief , Ocean bottom relief , Configuration of Pecific Indian and Atlantic ocean floor.
Unit III	**Ocean Salinity and Temperature** : Physical and chemical properties of sea wat Marine Sediments , Coral reef.
Unit IV	**Movement of the ocean water :** Ocean motions horizontal and vertical , Waves Tide currents , Costal beach and shoreline process
Unit V	**Marine Problems and Policy** Tsunamis , Elnino , Ocean resources . Sea level change and Global warming , Ocean routs , Ocean transgression . Marine policy and laws.

Second semester
Paper 5b
Tourism Geography with Spatial References to Himalaya
Code:SLE 205b

Unit	contents
Unit I	**Introduction and the Concept** Definition , Scope , Nature , Significance and Development of Tourism Geography . Concept and approaches of Tourism Geography , Geography of tourism as applied Geography Development of Tourism in the world .
Unit II	**Tourism Types** Types of tourism : Cultural , Coastal , Adventure tourism , National and International tourism , Eco - tourism . Globalization and tourism , Political fallouts . Tourism in India .
Unit III	**Components of Tourism** The Basic geographical Components of Tourism , Elements of Tourism , Inventory of Tourism resources , Tourism infrastructure . Organization Tourism
Unit IV	**Tourist industry** Nature Scope and characteristics . Trends and magnitude of modern Tourism Tourism and national economy growth impact and implications : Socio - cultural significance of Tourism and related issues
Unit V	**Planning for Tourism development** Development of Tourism in the Himalayas with special reference of Uttarakhand , Its existing potentials and promotion of Tourism - pilgrimage . Combine Tourism as a process of development and change in Hill region ; problems & planning measures . futuristic Tourism in the Himalayas.

Second semester
Paper 5c
Population Geography
Code:SLE 205c

Unit	contents
Unit I	**Meaning and Concepts** Meaning , Nature , Scope and Significance of Population Geography , Concepts approaches and Methods of population study , Sources of population data Development of population geography, population geography and demography.
Unit II	**Demographical Traits** Population Distribution , Growth , Density , Factors in population growth , App - S Structure , Fertility . Literacy and mortality analysis . Occupational and C structure . Population Cycle . Broad World patterns .
Unit III	**Population Dynamics** Population Movements , Definition and types of migration , Rural - Urban migration Push and pull factors . Urbanization . Theories and laws of migration Causes consequences of migration with special reference to Uttarakhand
Unit IV	**Theories and Model** Theories of population growth . Demographic Transition Model . Population Typology . Population Pressure . Inequality of resource availability , Over - Under and Optimum population , Population - Resource Regionalization .
Unit V	**Population Policies and Programmes** Human Development Index . Population Policies of developed (Canada . Japan) and developing (China , Brazil) countries , Population Projection , National population Policies in India . Human Resource Development planning.

Books Recommended :
1. Clarke , John 1. 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. & World Population and Production Woytinsky , E.W.I.
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 1. Population Geography and Developing Countries
10. Garnier , J. Beaiyeu Geography of Population.

SEMESTER -II

Paper Sixth

DISSERTATION (MINOR)

Code : SLE 206

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 in 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 - 11

SEMINAR / PRESENTATION

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 .

Third semester
Paper 1
Environmental Geography
Code:SLE 301

Unit	contents
Unit I	**Nature and Concept of Environment** Nature , scope and significance of environmental study : Approaches to environmental studies ; Concept of ecosystems , Concepts and principles of geography . ecology , Components and functions of ecosystems , Ecological perspective in Geography.
Unit II	**Biosphere and Ecosystem** Biosphere as an Major ecosystems of the earth , Biomes and their type Productivity and equilibrium in the ecosystems (stability , unity , and diversity) ,, Ford chain and Food webs , Energy flow in ecosystems , biogeochemical cycle , hydrological cycles, carbon cycle.
Unit III	**Ecology of Population** Growth curve , Law of population growth , biotic - potentials , Human Ecology - Population growth , Nasality and mortality in human population , Problems - of population growth ; Food production and world hunger , Green Revolution .
Unit IV	**Environmental Crises** Global climatic change . Shrinking of glaciers , Acidic rains , El - Nino - effect ; Desertification , Endangered genetic resources , Natural Hazards -earthquakes , cyclones landslips , draught , floods ; Cultural Hazards - man induced ecological changes i.e. Forest fires , pollution . Environmental Impact Assessment (EIA) .
Unit V	**Environmental Management and Planning** Concepts and principles of Environmental Management , Sustainable development , Integrated Watershed Management , Recycling of resources , waste disposal , reforestation , control of forest fire . , World Environmental Movements (Stockholm Conference , Earth summit , etc.) . Environmental programmes in India .

Third semester
Paper 2
Research Methodology
Code:SLE 302

Unit	contents
Unit I	**Basic of Research :** Meaning , objectives , concept and significance of research in Geography . Scientific method , Method and Technique . Approaches (qualitative a quantitative) and methods of Geographical research.
Unit II	**Types of research** basic or pure research , applied research , explanatory and descriptive research , quantitative and qualitative research , action and diagnostic research , historical and experimental research **Process of Research** Steps in research process , formulation of research problem , revie of literature . Geographical research problem : meaning , identification , selection a techniques defining research problem .
Unit III	**Hypothesis :** Definition , characteristics , significance , formulation and testing of hypothesis . Geographical research problems , selection and techniques of the problem. **Methods of Data Collection** Types of data , Methods of data collection ; primary and secondary data , schedule and questionnaire , observation and interview , audio - visual method and Tabulation of data.
Unit IV	**Sampling Design** Meaning , methods and steps and design of spatial sampling Probability sampling and non - probability sampling . **Research Design : Meaning , concept and types research design** Process of research formulation of synopsis , Preparation of maps and diagrams. .
Unit V	**Basic Concept of SPSS (Statistical Package for Social Science) :** Meaning a operations and data analysis , Application of remote sensing and GIS. **Report Writing** Meaning , types of report , steps . Bibliography : meaning and types Framing of pilot research project and preparation of research paper .

Third semester
Paper 3
Cultural Geography
Code:SLE 303

Unit	contents
Unit I	**Meaning and Concept of Cultural Geography** Nature concept and components of culture Geography , Development of Cultural Geography . Major concepts of Cultural Geography , Cultural Landscape , Cultural processes , cultural diffusion , cultural hearths ; Cultural Ecology .
Unit II	**Evolution and Development** Evolution of Culture and Humanization of the Earth : Brief cultural history of man . Migration processes and cultural development - prehistoric , primitive agrarian , Industrial revolution and cultural development ; Role of technological changes in cultural development .
Unit III	**Human races** Origin , dispersal and related theories ; Types and distribution ; Major ethnic . Racial groups . Religion and culture , Major Religions and Cultural groups . World distribution of languages ; Major linguistic cultural groups
Unit IV	**Development and Cultural Transformation** Man and the Biophysical environment ; Environmental perception , Resource and Culture , Agricultural innovations and dispersals . Industrial and Technological revolution ; Transport and Trade . Processes and elements of cultural transformation .. .
Unit V	**Cultural Regionalization** Problems and Criteria of Regional classification of cultures ; Major contributors to the study of cultural regionalization . Cultural regions of the world . Cultural realms- Monsoon Asian , Meso - African . Western European , Anglo - American .

Third semester
Paper 4
Practical
Field Surveying
Code:SLE 304

Unit	contents
Unit I	**Plane Table Survey** Intersection and Resection methods . Three point problem , Determination of height using Indian clinometers.
Unit II	**Prismatic compass survey :** Open and Close Traverse methods and error removed by Bowditch method .
Unit III	**Levelling and Triangulation :** Dumpy level Survey , contouring and profiling . EDM survey and Theodolight survey and total station / EDM
Unit IV	**GPS Survey :** Ground and Computer base mapping . Total Station and EDM survey
Unit V	**Survey Camp-** Field survey using by all instruments and camp report Writing .

Books Recommended :

1. Bygott , G.L .: Map works 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 . Depot , Allahabad .
5. Singh , L.R. and Singh , R. (1991) : Map work and Practical Geography , Central Bak Publications Pvt . Ltd. , New Delhi .
6. Wilkinson , H.R. and Monkhouse , F.J. (1952) : Maps and Diagrams , B.I. publications Pvt. Ltd. New Delhi.
7.Hails , J R (ed) , Applied Geomorphology , Elsevier Sci . Amsterdam , 1977 , montreal 1969 .
9. Pewe , T.L . (ed) : The periglacial Environment . Mc . Gill - Queen's University press
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 . Dubuque , 1995 .
12. Ritter , D.F. Craig , R. and Miller , J.P. , Process of Geomorphology , W.C Brown
13. Slymaker , O. (ed0 , Steepland Geomorphology.John Wiley , London , 1995 .
14. Sugden , D.E . and John , B.S. Glaciers and landscape . Edward Amold , London , 1976 .

Third semester
Paper 5a
Glacial Geomorphology
Code:SLE 305a

Unit	contents
Unit I	**Definition, Concept and Scope** Definition, scope, Concepts and significance of Glacial Geomorphology, Approaches and relationship with climatology. Ice Age, Causes of ice ages. Pleistocene Glaciations.
Unit II	**Types of Glaciers** Types , movement , morphology , advancement and retreat of glaciers . Important glaciers of the world . Concept of glacial cycle.
Unit III	**Glacial Processes** Erosional process ; glacial erosion , development of erosional landforms . Depositional process and landforms . Types and forms of moraines , glacio fluvial and glácio- lacustrine landforms .
Unit IV	**Periglacial Processes and Landforms** Periglacial process : frozen ground phenomenon -identifical , depth Variations , classification and distribution Periglacial landforms . adaptation of human beings to periglacial environment .
Unit V	**Techniques of glacial studies** Techniques of glacial studies- Remote sensing and GIS . Advanced Survey technique and use of GPS . Inventory of Himalayan Glaciers . Case study of Gangotri Glacier . Glaciers are as recreational recourse .

Third semester
Paper 5b
Natural Hazards and Disaster Management
Code:SLE 305b

Unit	contents
Unit I	**Meaning and Concept** Meaning , concept and scope of natural hazard and Disaster . Types of hazards , Elements of hazard , Disaster and hazard . Major requirements for coping with disaster.
Unit 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 . Disaster management cycle ..
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 . National disaster management policy in India .

Third semester
Paper 5c
Regional Planning and Development
Code:SLE 305c

Unit	contents
Unit I	**Meaning and Concept** Meaning , concept , scope and approaches of Regional planning ; types a hierarchical levels of regional planning local , regional and national ; Geography its role in regional planning & development.
Unit II	**Theories and Models** Theoretical and operational frame work of regional planning ; Classical economic growth theories- a review , stages of growth theory , central place theory and growth pole model and spatial diffusion theory , Comparative advantages theory , cumulative causation model , core - periphery model ,
Unit III	**Methods and techniques** Methods and techniques of regional analysis and planning ; planning process and delineation of planning regions - different approaches ; Short term and Long term planning , Multi level regional planning and Decentralized Planning .
Unit IV	**Regional Development** Regional developmental strategies , Identification of planning region , Planning for backward area , Hill area and Tribal area . Case studies of planning programmes - achievements , problems and prospects , form -Japan , China and U.K.
Unit V	**Regional Planning in India** Spatial inequalities and regional imbalances in India ; Regional planning in India trends and characteristics ; Planning for problem regions ; parameters and - identification of planning regions in India ; Dilema of development in mountain regions with special reference to Uttarakhand .

SEMESTER - III

Paper - Sixth

DISSERTATION (MINOR)

Code :SLE 306

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

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 / examinces will be done by external and internal examiners appointed by the Convener Head of the Department University .

Fourth semester
Paper 1
Regional Geography of Uttarakhand
Code:SLE 401

Unit	contents
Unit I	**Physical Setting** physical setting- geo - structural divisions , Physiographic regions . Drainage system , Climate , Natural vegetation.
Unit II	**Processes and Landforms** Glaciers , Fluvial , mass - wasting , Slope , and Relief , Landforms , Lakes , Natural Hazards and disaster . Natural regions of Uttarakhand . Hydro power Projects .
Unit III	**Cultural Aspects** Distribution , growth density of population . sex ratio , occupational structure and literacy . Rural hill migration . Tribes . Rural Settlement types , Pattern of Urbanization and Transport net work . Cultural regions of Uttarakhand .
Unit IV	**Land Resources** Distribution of land use , types , Agricultural land use , Horticulture , Animal Husbandry , Natural recourse , Tourism , and Industrial development.
Unit V	**Environmental Constraints** Spatial inequalities and regional imbalances in India ; Regional planning in India trends and characteristics ; Planning for problem regions parameters and identification of planning regions in Dilema of development in mountain regions with special reference to Uttarakhand .

Fourth semester
Paper 2
Urban Geography
Code:SLE 402

Unit	contents
Unit I	**Meaning and Concept** Meaning , scope and objectives of Urban Geography ; Approaches to the study of Urban Geography ; Theoretical and operational concepts of towns ; Towns in historical and spatial perspectives.
Unit II	**Urban Morphology** Urban setting - site , situation , growth and stages ; Urban morphology - Land use models and city growth - Concentric zone , sector and multiple nuclei models ; Centripetal and centrifugal forces of urban growth ; Urban land use .
Unit III	**Urban Functions** Demographic structure and characteristics of urban population ; Concept of urban functions ; Functional typology of urban centres - some qualitative and quantitative techniques of functional classification : Structure and characteristics of Central Business District (C.B.D.) . Slums - nature , types and dimensions - Indian context .
Unit IV	**Delimitation** City - region interaction , Urban Fringe Characteristics , Umland Parameters and delineation , Central Place Theory Centrality and functional hierarchy ; Rank- Size - Rule and city size & spacing . Regional pattern of urbanization - World & India
Unit V	**Planning and Policy** Models , layout and growth of planned cities ; some planned cities of India ; Urban development Planning in India - policies , programmes and implication . Hill towns of Uttarakhand .

Fourth semester
Paper 3
Geo- hydrology
Code:SLE 403

Unit	contents
Unit I	**Meaning and Concept** Definition , Concepts and scope of geo- hydrology , hydrology in relation to water resources development , Components of hydrological cycle , Hydrological cycle .
Unit II	**Water and its Disposition** Hydrological properties of rocks , Precipitation , Runoff process , Computation of runoff , Water Discharge and measurement , Hydrograph analysis .
Unit III	**Underground Hydrosphere** Structure of the underground hydrosphere , Vadose and phreatic Zones , Recharge and discharge of ground water , Types of aquifer . Underground water classification .
Unit IV	**Ground Water Movements :** Infiltration ; capacity , rate , and methods of computation . Evaporation of runoff , Hydraulic conductivity , Darcy's law , Permeability , Transmissibility . .
Unit V	**Conservation and Planning** Water balance , Utilization of water resources , Conservation of water ; present future perspective , planning and programs . Concept of artificial recharge and water harvesting , 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. Govt . of India , Ministry of Agriculture (1972) , Report of the Irrigation Commission , Vol . I to IV , New Delhi .
4. Govt . of India , Ministry of Agriculture (1974) , Report of National Commission on Agriculture , Parts IV & V , New Delhi .
5. Jackson , P.J. (1977) : Climate , Water and Agriculture in the Tropics , London . Committee for Geography , Calcutta .
6. Law , B.C. (ed .) (1968) : Mountains and Rivers of India , 21 , G.C. National Linslay , R.K. et.al. (1958) : Hydrology for Engineers , Mc Graw Hill .
7. Rao , K.L .: India's Water Wealth , Orient Longman .
8. David Knighton (1984) : Fluvial Forms and Processes , Edward Amold , London .

Fourth semester
Paper 4
Quantitative Technques
Code:SLE 404

Unit	contents
Unit I	Types of spatial data- Point , Line and Area , Levels of their measurement Nominal , Ordinal , Interval and Ratio . Diagrammatic representation of data- Circle , Spheres , Block pile ,
Unit II	Techniques of mapping- Dot . Choropleth and Isopleth . Elements of map Generalization , Symbolization and Classification .
Unit III	interpretation of Indian weather maps- July and January . Representation of Ergo graph , Climato graph and Hyther graph .
Unit IV	Statistical Techniques- Correlation , Regression Analysis , Deviation a Dispersions .. .
Unit V	Field Study work (GPS Survey mapping)

Fourth semester
Paper 5a
Mountain Geomorphology
Code:SLE 405a

Unit	contents
Unit I	**Basic Concept of Mountain Geomorphology** Nature , concept , location , extent and classification of mountains . Mountain Systems of the World .
Unit II	**Orogeny of the Mountains** Origen , plate tectonics and mountain building process . Geosynclines , relief , lithology and structures . Origin of the Himalaya.
Unit III	**Geomorphologic Processes** Glacial , fluvial , mass wasting , natural hazards , earthquakes , anthropogenic influences , climatic change etc.
Unit IV	**Landforms and geo - hydrology** Mountain hydrological system , landform mapping techniques , underground water , Watershed management ,. .
Unit V	**Importance of the Mountains** Aesthetic concept of mountains , sustainable mountain development , geopolitics of mountain regions , Problems of mountains . Future prospects of development in the mountains ,

References

- Ali , Aamir 2002. A Siachen peace park : The solution to a half - century of international conflict ? Mountain Research and Development , 22 (4) : 316-319 .
- Bebbington , Anthony and Mark Williams 2008. Water and mining conflicts in Peru . Mountain Research and Development , 28 (3/4) : 190-195 .
- Bernbaum , Edwin 1997. The spiritual and cultural significance of mountains . In Bruno
- Messerli and Jack D. Ives (eds .) , Mountains of the World : A Global Priority (pp . 39-60) , New York : Parthenon Publishing Group .
- Brown , Jessica and Nora Mitchell 2000 , Culture and nature in the protection of Andcan landscapes . Mountain Research and Development , 20 (3) : 212-217 .
- Brush , Stephen B. 1988. Traditional Agricultural strategies in the hill lands of tropical
- America . In N.J.R. Allan , G.W. Knapp , and C. Stadel (eds) , Human Impacts on Mountains . NJ : Rowman and Littlefield , pp . 116-126 .

Fourth semester
Paper 5b
Advanced GIS and GPS Applications
Code:SLE 405b

Unit	contents
Unit I	**Geographical Information System** Geography as a spatial science ; Basic concepts of GIS ; Components & Elements of GIS . Geo - referencing , Scale , Map Resolution : Types of Information in Digital Map ; Attribute Information ; Display Information ; Layering ..
Unit II	**Geographical Data Base and Data Models** Geographic Data Types : Spatial and Non - spatial data ; Principal Functions of GIS ; Data Capture ; Data Base and Spatial Data . Geo - Relational Data Model ; Topological Data Structure ; Attribute Data Management ; Relational Database - Concepts & Model .
Unit III	Geospatial Data Analysis , Digital elevation model (DEM) , Web GIS . Internet GIS , Computer Cartography , Recent trends of GIS .
Unit IV	**GPS Applications** Basic Concepts : GPS Components and Basic Facts ; Components of a GPS ; GPS Positioning Types ; Accuracy of GPS ; Reference station ; Application of GPS in resource mapping . Map Updating , Cadastral Mapping , Micro Level Surveying etc.
Unit V	**Applications of GIS** 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 .,

Books Recommended :

1. Aroneff , S. Geographic Information System : A Management Perspective , DDL Publication , Otawa , 1989 .
2. Burrough.P.A . Principles of Geographic Information System for Land Resources Assessment , Oxford University Press , New York , 1986 .
3. Fraser Taylor , D.R. Geographic Information System , Pergamon Press Oxford , 1991
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 , Washington , 1990 .
1. Star J. and J.E. Estes Geographic Information Systems : An Introduction . Prentice Hall , Engleweed Cliff , New Jersey , 1994 .
2. Chang . K.R. , 2012. Introduction to Geographical Information System . Tata Mcgraw Hiil . Education Private Limited , New Delhi .
3. Chauniyal , D.D. , 2016. Remote Sensing and GIS (Hindi) . Sharada Pustak Bhawan , Allahabad .

Fourth semester
Paper 5c
Political Geography
Code:SLE 405b

Unit	contents
Unit I	**Meaning , Concept and Scope** Definition , Concept , Nature , Scope and Approaches of Political Geography ; historical development ; Political Geography Vs Geo - politics ;
Unit II	**Concept of Boundaries** Frontiers and boundaries and their laws ; international boundaries functions and classification ; Buffer zones ; problems of land locked states ; territorial waters . Concept of state and nation ; Spatial factors of state - Location , size and shape ; Core area , capital city .
Unit III	**Geo - Politics of the world**, World geo - politics and geo - political regions of the world ; Colonization , Decolonization , Federalism , Strategic basics and Military alliance . Geopolitics of Indian ocean . Determinants of Sea power in Geo - strategic ideas of Haushofer , Mahan , Mackinder and Spykman .
Unit IV	**Geopolitical study of India and Neighbours** Geopolitics of India , Pakistan , and China . Geopolitics of SE Asia . Water dispute and Terrorism . State Politics of India . Non aligned movement . Buffer State and core area .
Unit V	**Electoral Geography of India** Concept , nature and scope of Electoral Geography . National and regional political parties and voting behaviours in India . Changing political nature of India . Legislative structure of Uttarakhand . Role and future of regional parties in Uttarakhand . Problem of re delineation of constitutions in Uttarakhand and its effects .

SEMESTER – IV

Paper - Fifth

Code : SLE 406

DISSERTATION (MAJOR)

The students will be required to select the topic and area with the help of their espective 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 ranges between 60 and 70 pages . The Dissertaion will be evaluated by the external and internal examiners as stated above . The viva voce examination and presentation will be conducted by both the examiners . The external examiner appointed by the Convener Head of the Department University .