

Revised Scheme of Study

BS 4-Year Geography Program

For the Session 2022-23 and Onwards



**DEPARTMENT OF GEOGRAPHY & GEOMATICS,
UNIVERSITY OF PESHAWAR, PAKISTAN**

**SCHEME OF STUDY FOR
BS-4 YEAR GEOGRAPHY**

The scheme of study for 4 year BS in Geography is given in the following table: The Course Code is given as per CMS Criteria of the University of Peshawar.

SCHEME OF STUDIES FOR BS 4 YEAR PROGRAM IN GEOGRAPHY

Course Code	Name of Subject	Credit Hours	Course Code	Name of Subject	Credit Hours
Semester-I			Semester-II		
ENG-101	English-I	3	ENG-102	English-II	3
IST-101	Islamic Studies	2	PST-101	Pakistan Studies	2
MATH-101	Calculus-I	3	STAT-107	Statistics-II	3
CS-101	Fundamentals of Computers (General-I) ***	3(2+1)	DM-101	Basic Science of Natural Hazard (General-II)***	3
STAT-100	Statistics-I	3	URP-104	History of Urban Planning (General-III) ***	3
GEOG-101	Fundamentals of Geography (Foundation-I)	3(2+1)	GEOG-111	Physical Geography (Foundation-II)	3(2+1)
Total Credit Hours		17	Total Credit Hours		17
Semester-III			Semester-IV		
ENG-103	English-III	3	ENG-104	English-IV	3
ES-101	Introduction to Environmental Science (General-IV) ***	3	ES-106	Fundamental of Ecology (General-VII) ***	3
URP-101	Introduction to Planning (General-V) ***	3	ZOO-112	Zoogeography and Paleontology (General-VIII) ***	3
GEO-103	Introduction to Geology (General-VI) ***	3	GEOG-131	Geography of Pakistan (Foundation-V)	3(2+1)
GEOG-121	Human Geography (Foundation-III)	3(2+1)	GEOG-132	History & Development of Geographical Thought (Foundation-VI)	3
GEOG-122	Map Work (Foundation-IV)	3(2+1)	GEOG-133	Land Surveying (Foundation-VII)	3(2+1)
Total Credit Hours		18	Total Credit Hours		18
Semester-V			Semester-VI		
GEOG-141	Principles of Cartography (Foundation-VIII)	3(2+1)	GEOG-151	Quantitative Geography (Foundation-IX)	3(2+1)
GEOG-301	Population Geography (Major-I)	3(2+1)	GEOG-311	Geographical Information Science (Major-VI)	3(2+1)
GEOG-302	Geomorphology (Major-II)	3(2+1)	GEOG-312	Remote Sensing (Major-VII)	3(2+1)
GEOG-303	Introduction to Climatology (Major-III)	3(2+1)	GEOG-313	Global Positioning System (Major-VIII)	3(2+1)
GEOG-304	Oceanography (Major-IV)	3(2+1)	GEOG-314	Digital Cartography (Major-IX)	3(2+1)
GEOG-305	Economic Geography (Major-V)	3(2+1)	GEOG-315	Research Methodology (Major-X)	3(2+1)
Total Credit Hours		18	Total Credit Hours		18
Semester-VII			Semester-VIII		
GEOG-321	Environmental Geography (Major-XI)	3(2+1)	GEOG-331	Settlement Geography (Major-XIII)	3(2+1)
GEOG-322	Political Geography (Major-XII)	3(2+1)	GEOG-332	Region & Regional Concept (Major-XIV)	3(2+1)
PROJ-497	Research Project Report-I/ Internship**	3(2+1)	PROJ-498	Research Project Report-II/ Internship**	3(2+1)
	Elective-I*	3		Elective-III*	3
	Elective-II*	3		Elective-IV*	3
Total Credit Hours		15	Total Credit Hours		15
GRAND TOTAL – 136					

* Students are allowed to select any four (4) electives from the given groups.

** Research project Report is of 6 credit hours spread over two semesters i.e. semesters 7 and 8.

*** The Students may select General Subjects from related Disciplines.

DETAILS OF COURSES

Course Title: **Foundation-I: Fundamentals of Geography**
Course Number: GEOG-101
Credit Hours: 2+1 (3)

Learning objectives: To make the student understand about the subject of Geography

Course outline

- Introduction and Definitions of Geography
 - Scope of the subject
 - Roots of the discipline and basic geographic concepts
 - The evolution of geography from ancient to modern period
 - Branches of Geography and its relations with other disciplines.
- Five Major Themes of Geography
 - Location: Absolute and relative
 - Place: Physical and anthropogenic characteristics
 - Interaction of different processes
 - Movement
 - Region
- Earth as a planet its celestial positions, shape and size.
 - Rotation and revolution and related phenomena
 - Earth's Satellite Moon
 - Lunar and Solar Eclipses
- Positions on Map and Globe,
 - Geographical coordinates and its characteristics,
 - World time zones standard and local time
- A glance at the Globe: distribution of land and water
- Introduction of Lithosphere, Hydrosphere, Atmosphere and Biosphere

Lab. Work: Study of maps, atlases and different types of models to understand various Geographical Phenomena.

Field Visit: to show the characteristics of places and man-environment interaction.

Books Recommended

- Christopherson, R.W. (2000), Geo-systems, Prentice-Hall, Inc, USA.
De Blij, H. J and Muller, P.O. (1996), Physical Geography of the Global Environment, USA, John Wiley and Sons Inc.
Fraser, C. (1993) Unlocking the five themes of Geography. Globe Book Company, New Jersey.
Gabler, R.E, Sager, R.J and Wise, D.L. (1997), Essentials of Physical Geography, Saunders College Publishing, New York
Mcliveen, J.F.R. (1992), Fundamentals of Weather and Climate, Prentice Hall New Jersey
Strahlar, A.N., Strahlar, A.H. (2004), Physical Environment, John Wiley. New York
Stringer, E.T. (2004), Modern Physical Geography, New York: John Wiley.
Taylor, J. (1993), Integral Physical Geography, London Longman
Thompson, R.D. et al. (1986), Process in Physical Geography, London, Longman.
Thurman, H.V. & Mexrill (1996), Essentials of Oceanography, Menson, London

Course Title: **Foundation-II: Physical Geography**

Course Number: GEOG-111

Credit Hours: 2+1 (3)

Learning objectives: To create an understanding about the characteristics of four spheres of the earth, and the processes which are bringing changes in these spheres.

Course outline:

- Introduction
 - Definition, scope and major branches
 - Realms of the physical environment
- Lithosphere
 - Internal structure of earth
 - Rocks—origin, formation and types: Igneous, Sedimentary and Metamorphic Rocks
 - Plate tectonics, mountain building forces
 - Geomorphic processes – endogenic and exogenic processes and their resultant landforms
 - Earthquakes and volcanic activity, folding and faulting
 - Weathering, mass wasting, cycle of erosion, erosion and deposition
 - Landforms produced by running water, ground water, wind and glaciers
- Atmosphere
 - Composition and structure of atmosphere
 - Atmospheric temperature and pressure,
 - Global circulation and wind systems
 - Cyclones and other disturbances
 - Atmospheric moisture and precipitation
 - Air masses and fronts
- Hydrosphere
 - Hydrological cycle
 - Ocean composition, morphology
 - Temperature, salinity and other characteristics of ocean water
 - Movements of the ocean water; waves, currents and tides
- Biosphere
 - Eco-systems
 - Formation and types of soils

Lab. Work: Identification of rocks and minerals, study and identification of landforms using Satellite imageries and Topographic Sheets. Construction and applications of models showing various types of landforms. Observation and recording of weather data from a mini weather station.

Field visits: Ground truthing and identification of various types of rocks, fluvial, glacial, desert landform, soils types. Visit to any suitable area to observe and appreciate the characteristics of physical features Mountainous, Plains, Plateaus, Deserts and Coastal areas.

Visit to any national park/biosphere reserves; Soil Survey of Pakistan, Geological Survey of Pakistan,

Books Recommended:

- King, C. A. M. (1980) Physical Geography, Basil Blackwell, Oxford.
- Mcliveen, J. F. R. (1992) Fundamentals of Weather and climate, Prentice Hall, New Jersey.
- Monkhouse, F. J. (1996) Principles of Physical Geography, Hodder & Stoughton, London.
- Peterson, J. F., Sack, D. & Gabler, R. E. (2011) Physical Geography, Brooks Cole.
- Scott, R. C. (1996) Introduction to Physical Geography, West Publishing Co, New York.
- Small, R. J. (1989) Geomorphology and Hydrology, Longman, London.
- Strahler, A. (2013) Introduction to Physical Geography, John Wiley & Sons, New Jersey.
- Strahlar, A. N., Strahlar, A. H. (2004) Physical Environment, John Wiley, New York.
- Stringer, E. T. (2004) Modern Physical Geography, John Wiley, New York.
- Thornbury, W. D. (2004) Principles of Geomorphology, John Willy & Sons, New York.
- Thurman, H. V. & Trujillo, A. P. (2013) Essentials of Oceanography, Prentice-Hall, Inc, New York.

Course Title: **Foundation-III: Human Geography**
Course Number: GEOG-121
Credit Hours: 2+1 (3)

Learning Objective: This course attempts to impart knowledge regarding the interaction and relationship between man and environment and associated problems.

Course outline:

- Introduction
- Definition, scope and branches
- Basic approaches
- Approached to Human Geography: Environmental Determinism, Possibilism, Probabilism, Cognitive behaviourism, Coupled nature-human systems
- Population and its characteristics, Population distribution, structure and composition
- Population dynamics: fertility, mortality, migration
- Economic activities
- Classification of Economic Activities
- Agriculture, mining, forestry, animal husbandry and poultry raising
- Industries: cottage, light and heavy
- Trade, transport and services
- Tourism
- Human Settlements
- Theories of human settlement
- Types of settlements
- Rural settlements
- Dispersed, Nucleated and Ribbon Settlements
- Urban Settlements
- Urban hierarchy and functions
- Urbanization
- Process of urbanization
- Urban structure, morphology and theories
- Land use and land cover patterns
- Environmental issues, causes and remedies

Lab work: to represent population characteristics, economic activities and settlement types on maps of various scale at local, regional, and supra-regional levels and correlate it with the physical characteristics of those localities.

Field visits: To explore economic activities in the context of natural environment of relevant area/region. To study rural and urban settlements, industrial areas and national parks.

Books recommended:

- Ahmed, Q. S. (2001) Fundamentals of Human Geography, Royal Book Company, Karachi.
- Becker, A. & Secker. (2002) Human Geography: Culture, Society, and Space, John Wiley and Sons, New Jersey.
- Becker, A. & Secker. (2002) Human Geography: Culture, Society, and Space, New York; John Wiley and Sons, New Jersey.
- Benko, G. & Shorhmay. (2004) Human Geography: A history for the 21st century, Hodder Arnold, London.
- Blij, H. J. D. (2002) Human Geography: Culture, Society, and Space, John Wiley and Sons, New Jersey.
- Fouberg, E. H. (2012) Human Geography People, Place and Culture, John Wiley & Sons, Inc., Hoboken.
- Getis, A. & Getis, J. (2005) Human Geography: Landscape of Human Activities, McGraw Hill higher Education, Boston.
- Harper, H. L. (2003) Environment and Society: Human Perspectives on Environmental Issues. Prentice Hall, New York.

Course Title: **Foundation-IV: Map Work**
Course Number: GEOG-122
Credit Hours: 2+1 (3)

Learning Objective: To train students in map drawing, reading and its use for geographical analysis

Course outline:

- Introduction to Maps
- Essential elements of map
- Classification and types of map
- Principles and methods of map making, reading and reproduction
- Scale: types and their use, construction
- Grid reference, coordinate system and indexing methods
- Enlargement and reduction of maps
- Map projections: types, main principles, choice of projection characteristics and uses
- Graphic/Mathematical construction of Cylindrical, Conical and Zenithal projections
- A study of the Survey of Pakistan maps:
 - Historical development of survey and mapping in Pakistan
 - Numbering system
 - Physical and cultural features to be described and interpreted
- Interpretation of weather maps of Pakistan

Lab work: to work with maps in understanding scale its relationship with maps area, distance calculation of area on the map; symbolization process; work on the contour line, drawing of valley profiles, calculation of gradient. Record of practical.

Field visits: Visit to Survey of Pakistan and Pakistan Meteorological Department.

Books recommended:

- Carey, H. H. (1983) How to Use Maps and Globes, Franklin Watts, New York.
Guljan, R. & Mushtaq, R. (1974) Map Projection, Oxford University Press, Oxford.
Kraak, M. J. & Ormelling, F. J. (1996) Cartography: Visualization of Spatial Data Harlow, Longman.
Robinson, A. H. (2002) Elements of Cartography, John Wiley & Sons, New York.

Course Title: **Foundation-V: Geography of Pakistan**
Course Number: GEOG-131
Credit Hours: 2+1 (3)

Learning Objective: This course attempts to impart knowledge regarding the relationship between man and physical, socio-economic and cultural environment including land, population, human settlements, resources and related human activities with special reference to Pakistan,.

Course outline:

- Introduction and genesis of Pakistan
- Geo-strategic position of Pakistan
 - Location and geographical significance
 - Geo-political importance
 - Administrative setup
- Land and Physical Environment:
 - Physiography
 - Climate and climatic regions
 - Hydrology
 - Soils and vegetation

- The People
 - Population characteristics: structure, composition and distribution
 - Population change
 - Urbanization
- Economy
 - Agriculture (crops and livestock). Irrigation
 - Power and mineral resources
 - Industries
 - Trade
 - Tourism
- Transport and Communication
- Major challenges of Pakistan
 - Water, power, security and environmental issues

Lab. Work: Survey, data collection and presentation on different thematic maps

Field visits: To identify various physical regions and study of at least one region's land use, urban structure, mining area, national parks, industrial areas and various rural and urban settlements and other natural resources.

Books recommended:

- Ahmad, K. S. (1978) Geography of Pakistan, Oxford University Press, Oxford.
 Burkey, J. S. (1991) Pakistan the continuing search for Nationhood, Western Press Oxford, UK.
 Davidson, A. P. & Ahmad, M. (2003) Privatization and the Crisis of Agricultural Extension
 Dichter, D. (1967) Geography of N-W.F.P, Oxford University Press, Oxford.
 Hameed, A. (1972) Study of the Middle Indus Basin, San Francisco State College, San Francisco.
 Khan, F. K. (1991) Geography of Pakistan, Oxford University Press, Karachi
 Spate, O. H. K. (latest edition) India and Pakistan, Methuen, New York., London
 Tayyeb, A. (1973) A Political Geography of Pakistan, Oxford University Press. Oxford.

Course Title: **Foundation-VI: History & Development of Geographic Thought**
 Course Number: GEOG-132
 Credit Hours: 2+1 (3)

Learning Objectives: To study the evolution of geographic thought and concepts from classic to modern times.

Course outline:

- Nature of Geography
- Evolution of Geography
 - Pre-classical and classical periods: ancient Geography
 - Medieval Geography: Muslim contributions, European contributions.
 - Modern Geography: Humboldt and Ritter,
 - Geography from the middle of the 20th century,
 - Dichotomies-physical and human, systematic and regional.
 - Quantitative Revolution, Geo-informatics and Ecology.
- Established traditions: Earth science, area study, spatial organization, man-land, system analysis and cartographic science.
- Man-environment interaction themes: Environmental Determinism, Possibilism, Probabilism, Cognitive Behaviourism, World views on man-environment relationship.
- Development of Nomothetic traditions: facts, concepts, hypotheses and paradigms, Ideographic vs. Nomothetic.
- Philosophical framework: Positivism: Pragmatism, Phenomenology

- Evolution of modern tools and models in geography
- Development of geography in Pakistan

Lab. Work: Writing of assignments and construction of maps showing the travels and voyages of famous explorers; diagrammatic representation of various models and relating them to geographical thought and seminar presentation on given themes.

Books recommended:

- Cresswell, T. (2013) *Geographic Thought: A critical Introduction*, Wiley-Blackwell, Oxford.
 Clayton, K. & Johnson, J.H. (Ed.), (1988) *Aspects of Geography*, Macmillan, London.
 Dickinson, R. E. (1969) *The Makers of Modern Geography*, Routledge, London.
 Dickinson & Howarth, O.J.R. (1933) *The Making of Geography*, The Clarendon Press, Oxford.
 James, P. E. & Mailim G. J. (1981) *All Possible Worlds*, John Wiley & Sons, New York.
 Johnston, R. J. (1983) *Geography and Geographers*, Edward Arnold, London.
 Kenzer, M. S. (Ed.) (1989) *On Becoming a Professional Geographer* Columbus, Merrill Publishing Co., UK.
 Mayhew, S. (1986) *Geography*, Harmonds Worth: Penguin
 Mitchel, B. (1989) *Geography and Resources Analysis*, Longman, New York.
 Tim, U. (1992) *The Place of Geography*, Longman, London.
 Unwin, D. (1989) *Introductory Spatial Analysis*, Methuen, New York.

Course Title: **Foundation-VII: Land Surveying**
 Course Number: GEOG-133
 Credit Hours: 1+2 (3)

Learning Objectives: To train students in different surveying techniques

Course Outline:

- Introduction
- Instrumental surveys
- Carrying out practical survey using the following instruments:
 - Chain and tape Survey
 - Plane Table
 - Prismatic Compass
 - Determination of heights and slopes with Abney Level
 - Contouring by Indian Clinometer
 - Use of Dumpy level and Theodolite
 - Use of Total station for surveying
 - General introduction of Global Positioning System (GPS)

Lab. Work: Preparation of the practical note book and keeping the practical record of all the exercises is mandatory.

Field visits: Visit to Survey of Pakistan and other concerned departments.

Books recommended:

- Carey, H. H. (1983) *How to Use Maps and Globes*, Franklin Watts, New York.
 Clendinning, J. (1970) *Principles of Surveying*. Blackie and Sons, New Jersey.
 El-Rabbany, A. (2006) *Introduction to GPS: The global Positioning System*, 2nd edition;
 Artech house. Boston.
 Guochang, X., (2007) *GPS: Theory, Algorithms and Applications*, 2nd edition, Springer,
 New York.
 Kaplan, (Ed.) (2006) *Understanding GPs: Principles and Applications*. Artech House,
 London.
 Kennedy, M. (2010) *The Global Positioning System in ArcGIS*, Tyler and Frances Group,
 New York.
 Taylor, G. & Blewit, G. (2006) *Intelligent Positioning: GIS-GPS Unification*. John Wiley
 & Sons, New Jersey.

Course Title: **Foundation-VIII: Principles of Cartography**
Course Number: GEOG-141
Credit Hours: 2+1 (3)

Learning Objectives:

To familiarise students with map-making science and its applications.

Course outline:

- Historical Evolution of Cartography
- Basic geodesy, spherical, ellipsoidal and geoidal earth, geographical and planer coordinates, properties of the graticule and geodetic position.
- Map Datums and its characteristics
- Symbolization, symbol types and graphic variables, the symbolization problems, symbolizing graphic features.
- Lettering principles.
- Mapping statistical surfaces: Thematic map, choropleth, dot map, isolines, and area cartograms.
- Principles of cartographic design, general design problems; design of map symbols. Basic procedure and designing of the thematic maps such as topographic, climatic, economic, population, settlements, urban morphology etc.

Lab. Work: Drawing of various thematic maps and other relevant exercises in cartography and mapping. Showing the socio-economic data on the maps and keeping the records of each and every exercise in a note book

Books recommended:

- Bygot, J. (1960) An Introduction to Map Work & Practical Geography, Tutorial Press, London.
- Campbell, J. B. (2010) Introduction to Remote Sensing, The Guilford Press, London.
- Clarke, K. (2010) Getting started with Geographic Information System, Prentice Hall, New York.
- Foresman, T. (1997) The history of Geographic Information System, Prentice Hall, New York.
- Grampton, J. W. (2010) Mapping: A critical introduction to Cartography & GIS. John Wiley & Sons, New York.
- Heywood, I. C. S. & Carver, S. (2003) An introduction to Geographic Information System, Addison Wesley Longman, New York.
- McDonald, R. & Burrough, P. (2001) Principles of Geographic Information Systems, Oxford University Press, Karachi.
- Maguire, D. J. (1991) Geographic Information System. Longman, London.
- Robinson, A. N., Morrison, J. L., Muehrcke, P.C., Kimerling, A. J., & Guptill, S.C. (2002), Elements of Cartography, John Wiley, New York.

Course Title: **Major-I: Population Geography**
Course Number: GEOG-301
Credit Hours: 2+1 (3)

Learning Objectives: To make students understand the dynamics of population characteristics; Relationship between man, environment and resources. To highlight the importance of demographic data in planning and decision-making.

Course outline:

- Introduction
- Population theories
- Sources and methods of population data collection and associated problems
- Population distribution and density
- Urban and rural population

- Population characteristics: Physical, Social and Economic
- Population dynamics: Patterns of fecundity and fertility, morbidity and mortality
- Migration and its types: internal and international migration patterns and their impacts
- Demographic transition
- Population growth and change
- Population Projections
- Population policies

Lab. Work: Consultation of the Population Census of Pakistan and representation of population data on maps.

Books Recommended:

Beayheu, G. J. (1966) Geography of Population. Prentice Hall, UK.
 Beshers, J. M. (1967) Population Processes in Social System, New York.
 Glenn, T. (1969) A Geography of Population World Pattern, John Wiley & Sons. New York & London.
 John. I. C. (1997) Population Geography, UK.
 Waren, C. R. (1967) Studies in Demography of Pakistan, Karachi.
 William, F. H. & Meluyn, J. (1993) An Introduction to Population Geography. University Press Cambridge, UK.
 Wrebur, Z. (1970) A Prologue to Population Geography, Prentice Hall, New Jersey.

Course Title: **Major-II: Geomorphology**
 Course Number: GEOG-302
 Credit Hours: 2+1 (3)

Learning Objectives: To make students understand the origin and recognize different types of landform with the help of shape, material and process.

Course outline:

- Scope and status of geomorphology
- Introduction to geomorphic concepts/principles
- Factors of landform development; structure, process and geological time scale
- Endogenic Processes
 - Isostasy, Diastrophism
 - Continental drift, Plate tectonic
 - Volcanism, Earthquakes
- Exogenic Processes
 - Weathering; mass wasting and their types
- Cycle of erosion: fluvial , glacial, eolian and Karst
- Fluvial erosional landforms, transportation mechanisms of running water; fluvial depositional landforms, types of drainage patterns and structure
- Glacier formation, glacier as geomorphic agent: glacial erosion and depositional landforms; glacio-lacustrine and glacio-fluvial features
- Eolian landforms: wind as geomorphic agent; eolian erosional landforms, transportation by wind; Eolian depositional landforms
- Ground water: porosity and permeability of rocks; aquifers
- Karst topography and associated landforms
- Sea wave as geomorphic agent; erosional and depositional landforms
- Soil development: factors of soil formation, physical and chemical properties of soil, soil profile, texture and structure; types of soils

Lab. Work: Lab. work must be conducted for soil, rocks and minerals recognition where relevant material is readily available. Geomorphic profiles, use of Remote sensing techniques for the interpretation of landforms and geomorphic features

Field Visit: Field trips to accessible areas for an in-depth geomorphic studies.

Books Recommended:

- Burbank, D. W. & Anderson, R. S. (2011) *Tectonic Geomorphology: A Frontier in Earth Science*, Blackwell Science, New Jersey.
- Charlton, R. O. (2008) *Fundamentals of Geomorphology*, Routledge Taylor & Francis Group, London.
- Clarke, J. I. (1958) *The Study of Soils*. Oxford University Press: Oxford.
- Dury, G. H. (1960) *The Face of the Earth*. Penguin Books. London.
- Hagget, R. J. (2011) *Fundamentals of Geomorphology*, Routledge, London.
- King, C. (1976) *Techniques in Geomorphology*. Edward, London.
- Leopold, L. B., Wolman, M. G. & Miller, J. P. (1995) *Fluvial Processes in Geomorphology*, Dover Publications, UK.
- Ritter, D. F., Kochel, R. C. & Miller, J. R. (2011) *Process Geomorphology*, McGraw-Hill, New York.
- Russels. (1959) *The World of Soils*, Collins Books, London.
- Spark, B. W. (1986) *Geomorphology*, Longmans, London /New York.
- Summerfield, M. (1996) *Global Geomorphology*, Prentice Hall Inc., New York.
- Thornbury, W. D. (2004) *Principles of Geomorphology*, John Wiley & Sons, London.
- Wooldridge, S. W. & Morgan, R. S. (2009) *An Outline of Geomorphology: The Physical Basis of Geography*. Longmans. London /New York.

Course Title: **Major-III: Introduction to Climatology**
Course Number: GEOG-303
Credit Hours: 2+1 (3)

Learning objectives: This course is designed for the study of climatic elements, variations in weather and climate both spatially and temporarily. The major climatic regions of the world and human impacts on climatic are also treated as important topic of study

Course outline

- Introduction, Scope and significance of climatology
- Composition and structure of atmosphere
- The energy balance and factors of variation
- Elements of climate and their inter relationship
 - Temperature, Pressure Winds and humidity
- Motions in atmosphere
- Condensation and Precipitation: Prerequisites and types
- Climatic classification, major climatic regions of world and Pakistan
- Contemporary issues related to climate
 - Global Warming, Climatic Change and Southern Oscillation

Lab. Work: Weather map interpretation and analysis. Observation of weather elements

Field visit: Visit to Metrological department office and hands on exercises on synoptic weather forecast.

Suggested Readings

- Stringer, E.T. (2004), *Modern Physical Geography* New York: John Wiley.
- Miller A. (2001), *Climatology*, Methuen New York.
- Graedel, T. (1995), *Atmosphere, Climate and Change*, Scientific American, New York.
- Lamb, H, (1992), *Climate History and the Modern World*, Methun & Co. Ltd. London.
- Sellers, A. & Henderson, A. (1986), *Contemporary Climatology*, Longman London.
- Strahler, A. N. (1998), *Elements of Physical Geography*, John Wiley New York.
- Thompson, R. (1997), *Applied Climatology, Principles and Practice*, Routledge Canada.
- Trewartha, G.T. (1996), *Climate System Modeling*, McGraw Hill New York.

Course Title: **Major-IV: Oceanography**
Course Number: GEOG-304
Credit Hours: 2+1 (3)

Learning Objective: To develop a comprehension of the origin of oceans, geomorphology, circulation and resultant physical characteristics of the oceans among the students.

Course outline:

- Introduction
- Origin of oceans and seas: major water masses and their distribution.
- Morphology of the ocean basins.
- Ocean floor deposits, their characteristics and classification.
- Temperature, salinity and density of ocean water; distribution, causes and effects
- Oceanic circulation: waves, currents and tides, their nature, causes, effects and impact on environment.
- Special phenomena: tropical storms; Tsunami.
- Oceanography of Arabian Sea with special reference to Exclusive Economic Zone.

Lab. Work: drawing features of the Ocean floor, mapping of the ocean currents, tides and associated phenomena.

Field visit: Visit to any coastal area to study the various coastal morphological features.

Books Recommended:

Johnson H. (1996), An Introduction to Oceanography. McGraw Hill, New York.
Murry. (2000) The Ocean, McGraw Hill, New York.
Thurman, H. V. & Trujillo, A. P. (2010) Essentials of Oceanography. Prentice Hall, Canada.

Course Title: **Major-V: Economic Geography**
Course Number: GEOG-305
Credit Hours: 2+1 (3)

Learning Objective: To create an understanding of Spatial variations of Economic resources and activities with reference to global and national scenarios.

Course outline:

- Introduction
- Evolution of world economic systems: Medieval feudal economics, economic impacts of colonialism. Modern world economic systems
- Concept of natural resources and reserves
- Human resource and its development
- Classification of economic activities
- Primary activities; gathering, hunting, herding, subsistence, Intensive and extensive farming, commercial grain farming, livestock farming, dairying, mixed farming, plantation farming, lumbering, fishing and mining
- Green revolution and its implications
- Secondary activities: Industrial revolution and manufacturing industries
- Tertiary activities
 - Trade and service functions
 - Transport systems.
- Quaternary and Quinary activities
- Regional inequalities, sustainable development and poverty alleviation
- Impacts of Globalization

Lab. work: Collection and presentation of data from Economic Survey of Pakistan, Agricultural Statistics of Pakistan etc. pertaining to economic activities on maps with the help of different cartographic methods.

Field visit: to accessible areas to observe and appreciate various economic activities and their relevance with the physical environment.

Books Recommended:

- Aoyama, Y., James T. M. & Susan H. (2012) Key Concepts in Economic Geography, Sage, Singapore.
- Alnwick, H. (2012) A Geography of Commodities, Harrap, London.
- Khan, F.K. (1998), An Introduction to Economic Geography. Oxford Publishers, Karachi.
- Knox, P & Agnew, J. (2008), The Geography of the World Economy. , Edward Arnold, London.
- Luckas, M. R. (1991) Economic Activity., Longman group, UK Limited
- Smith, J. R., Phillips, M. O. & Smith, T. S. (2013) Industrial and Commercial Geography. Hott, Rinehart and Winston, New York.
- Thoman, C. & Yeats. (1988) The Geography of Economic Activity, McGraw-Hill Book Company, New York,
- Thomes, R. S. & Hagget, R. J. (1980) Models in Geography. Harper and Row Publishers, London.
- Williams, T. R. (1991) Economic Geography., Longman group, New York.

Course Title: **Foundation-IX: Quantitative Geography**

Course Number: GEOG-151

Credit Hours: 2+1 (3)

Learning Objectives: To train students in collection, analysis, interpretation and presentation of quantitative spatial data and to enable them to organize and conduct independent research
To use database software for the analysis of both Spatial and Temporal data

Course outline:

- Introduction
- Quantitative revolution and its impact on Geography
- Parametric and non-parametric statistics
- Nature of geographical data and measurement scales.
- Data summarizing techniques: theory of central tendency, dispersion, and variability.
- Time Series: graphs, growth and decline, index numbers, logarithmic scales, trends and fluctuations, components of time series.
- Methods of drawing trend lines for linear and exponential series scatter diagrams, standard errors and probability, correlation and regression.
- Quantitative models in Geography

Lab. Work: Introduction to EPI-Info SPSS E-view, MS Excel, MiniTab and other relevant software database for quantitative analysis.

Books Recommended:

- Haring, L. L. (2002) Introduction to Scientific Geographic Research, Oxford: ECB
- Levin, J. (2006) Elementary Statistics in Social Research, Pearson, New Delhi.
- Maguire, D. J. (1989) Computers in Geography, London: Longman.
- Matthew, H. & Foster, I. (1991) Geographical Data. Sources, Presentation and Analysis, Oxford University Press: London.
- Mckillup, S. & Melinda, D. D. (2010), Geo-statistics Explained, Cambridge University press, Cambridge.
- Walford, N. (2011) Practical Statistics for Geographers and earth Science, Wiley- Blackwell, Singapore.

Course Title: **Major-VI: Geographical Information Sciences**
Course Number: GEOG-311
Credit Hours: 2+1 (3)

Learning Objective:

The course aims to equip students with an understanding of GIS, evolution and applications of spatial data through Geo-spatial technologies.

Course outline:

- **Introduction:**
 - Definitions, key components, functional subsystem,
 - Raster data model, vector data model, attribute data model,
 - Data acquisition techniques, data sources, data capturing techniques and procedures,
 - Data transformation,
 - Visualization of spatial data, layers and projections and datums
- **Map design:**
 - Symbols to portray points, lines, polygons and volumes, graphic variables,
 - Visual hierarchy,
 - Data classification graphic approach, mathematical approach.
- **Spatial analysis:**
 - Neighbourhood functions, network, and overlay analysis,
 - Buffering, spatial data quality
 - Components of data quality, micro level components,
 - Macro level components, usage
 - Components, sources of errors, accuracy and resolution and uncertainty.
- **GIS Applications**

Lab. Work: Map layout, Data Classification and Thematic Mapping, Handling of Topological Errors, Overlay and network analysis.

Books Recommended:

- Aronoff, S. (2004) Geographic Information Systems, A Management Perspective
WDL Publications, Ottawa.
- Burrough, P. (2002) Principles of Geographic Information Systems for Land
Resources Management., Oxford University Press, Oxford
- Demers, M.N. (2008) Fundamentals of Geographical Information Systems. Fourth
Edition. John Wiley & Sons, New Jersey.
- Heywood, I, Cornelius, S., & Carver, S. (2011) An Introduction to Geographical
Information System, Fourth Edition. Prentice Hall, New Jersey.
- Longley, P. A., Goodchild, M., Maguire, D. J. & Rhind, D. W. (2010) Geographic
Information Systems and Science. Third Edition. John Wiley& Sons, UK.
- McDonald, R. & Burrough, P. (2001) Principles of Geographic Information
Systems, Oxford University Press, Oxford.

Course Title: **Major-VII: Remote Sensing**
Course Number: GEOG-312
Credit Hours: 2+1 (3)

Learning Objectives:

- To introduce knowledge of recording earth's surface features from space-borne platforms and different ways in which images can be analysed.
- To enable students to develop an understanding of common remote sensing products such as, earth resources satellite images, aerial photographs etc.
- To develop a comprehension regarding ground-truthing aided by GPS

Course Outline:

- Introduction
- History and Development
- Concepts and Foundation of Remote Sensing
- Electromagnetic spectrum
 - Visible Spectrum
 - Colour Theory
 - Atmospheric Attenuation
- Types of Remote Sensing Systems
 - Active Remote Sensing
 - Passive Remote Sensing
- Type of Sensors
 - RBV, MSS, TM, HRV, HRPT/APT/AVHRR, MODIS (Terra and Aqua)
 - Non-imaging systems (RADAR)
- Types of Satellites
 - Manned Satellites (Gemini, Mercury, Apollo, Space Shuttles)
 - Unmanned Satellites (Metrological, Earth Resources, Telecommunication, Spy, Scientific etc.)
- Platforms (Orbits)
- Ground Receiving Stations (Reception of Data)
- Image Processing
- Image Classification
- Image Interpretation
 - Image Interpretation Methods
 - Image Interpretation Elements
 - Image Interpretation Tasks
 - Image Measurements
- Remote Sensing in Pakistan: Problems Potential and Prospects
- Applications in different fields e.g. Hydrology, Geology, Climatology, Environmental Application, Planning, Agricultural, Forestry, Socio-economic, Health etc.

Lab Work: Introduction to labs., single band image interpretation, false color predictions, false color composite images interpretation, visual interpretation of aerial photographs, various sensors data comparison, thermal infrared image interpretation, introduction to ERDAS imagine, display, geo-linking, identification of targets, field trips.

Books Recommended:

- Aber, J. S., Marzol, f. I., & Ries, J. (2010) *Small-Format Aerial Photography: Principles, Techniques and Geoscience Applications*, Elsevier, Amsterdam.
- Campbell, J. B. & Wynne, R. H. (2011) *Introduction to Remote Sensing*. Fifth Edition. Guilford Press, New York.
- Iliffe, J. & Lott, R. (2008) *Datums and Map Projections for Remote sensing, GIS, and Surveying*. Second Edition. Whittles Publishing, UK.
- Jensen, J. R. (2011) *Remote Sensing of the Environment: An Earth Resource Perspective*. Second Edition. Prentice Hall, New Jersey.
- Lillesand, T. M., Kiefer, R. W. & Chipman, J. W. (2007) *Remote Sensing and Image Interpretation*. Sixth Edition. John Wiley and Sons., New Jersey.
- Weng, Q. (2010) *Remote Sensing and GIS Integration: Theories, Methods and applications*, McGraw Hill, New York.
- Wolf, P., DeWitt, B. & Wilkinson, B. (2012) *Elements of Photogrammetry with Application in GIS*. Fourth Edition. McGraw-Hill, New York.

Course Title: **Major-VIII: Global Positioning Systems**
Course Number: GEOG-313
Credit Hours: 2+1 (3)

Learning Objectives: This course attempts to provide training on the fundamental aspects of GPS and Geodesy, various GPS measurements, their corresponding accuracies and identification of targets.

Course Outline:

- Introduction to GPS and Navigation System
- History of GPS
- GPS working mechanism
- Components of GPS: Space Segment, Control Segment, User Segment
- GPS Data, Position and Time from GPS, Velocity
- GPS Errors, Sources of Errors
- GPS Satellite Signals, Pseudo-Range Navigation
- Differential GPS Techniques
- Tracking
- GPS Techniques and Project Costs

Lab Outline: GPS value reading, Easting Northing & elevation, Map Projections and Datum Settings, GPS based surveys, tracking, navigation and data processing, GPS Project.

Books Recommended:

Michael Kennedy (2002) *The Global Positioning System and GIS: An Introduction*. 2nd Edition, Taylor & Francis, New York.

Heywood, I., Cornelius, S. and Carver, S. (1999) *An introduction to Geographic Information System*. Addison Wesley Longman, New York, second edition. ISBN: 0 –81-7808 – 982 -3

Paul Zarchan (1996) *Global Positioning System: Theory and Application*. Volume I, American Institute of Aeronautics and Astronautics, Inc., Washington DC.

Aronoff, S. (1995) *Geographic Information Systems: A Management Perspective*. WDL Publications, Ottawa, Canada, Forth edition.

GPSCO (1992) *Getting started with GPS Surveying*. GPSCO Land Information Centre, NSW, Australia.

Course Title: **Major-IX: Digital Cartography**
Course Number: GEOG-314
Credit Hours: 2+1 (3)

Learning Objectives:

To familiarise students with map-making science by the state-of-the-art modern information technology i.e. computer.

Course outline:

- Introduction to Digital Cartography
- Technology and Cartography: Numerical and Digital Cartography,
- Traditional Cartography, Automatic Cartography, Numerical Cartography
- Coordinate Systems: Ellipsoidic (or Geodetic or Geographic) Coordinates, Cartesian Geocentric Coordinates, Planar Cartographic Coordinates
- Data capture: Data types – point, line, areal features; Raster data; sources, scanning, digitization, storage
- Terrain data (Digital Elevation Model/ Digital Terrain Model)
- Symbolization, symbol types and graphic variables, the symbolization problems, symbolizing graphic features, colours.
- Layouts Design: Primary elements, secondary elements; Annotation; Lettering principles. color, font
- Mapping statistical surfaces: Thematic map, choropleth, dot map, isolines, and area cartograms.

- Map production, form of map output, construction material, output options, composing separations, proofing.

Lab. Work:

Introduction to different digital cartographic software; digitization, symbolization of layer, creating layouts and drawing of various thematic maps and other relevant exercises in cartography and mapping.

Books recommended:

Gomarasca, Mario A. 2009. Basics of Geomatics. Springer Science and Business Media B.V. London
 Peterson, Gretchen N. 2009. GIS Cartography: a guide to effective map design. CRC Press, Taylor & Francis Group, LLC, New York.
 Slocum, Terry A., Robert McMaster, Fritz Kessler and Hugh Howard, 2009, Thematic Cartography and Geographic Visualization, 3rd Edition, Prentice-Hall, Upper Saddle Creek, NJ.
 Robinson, A. N., Morrison, J. L., Muehrcke, P.C., Kimerling, A. J., & Guptill, S.C. (2002), Elements of Cartography, John Wiley, New York.

Course Title: **Major-X: Research Methodology**
 Course Number: GEOG-315
 Credit Hours: 3

Learning Objective:

To create awareness among students regarding basics of geographical research

Course outline:

- Introduction
- Research approaches
- Research paradigms in Geography
- Types of research: historical research, qualitative/descriptive research, quantitative/experimental research
- Research design; research topic, formulation and statement of a problem, research questions, research hypotheses, research objectives, research plan
- Literature review; Literature sources: Journals (types) Books, Monographs and web sources
- Data collection, sources of data, universe and sampling: primary and secondary data
- Selection of a sample and measuring instruments, basic considerations in sampling, size of sample, geo-statistical considerations, Sampling units and design; points, traverses, random sampling, stratified sampling, systematic sampling
- Field Techniques
- Preparing data for analysis: use of the descriptive statistics and quantitative methods
- Data analysis and interpretation: pre-analysis considerations.
- Data presentation
- Research report writing; Proposal and Synopsis writing
- Bibliography and references

Lab. Work:

Preparation of Research presentations with the help of software (end note, reference manager etc.).

Books Recommended:

Baker, A. R. H. & Billinge, M. (2011) Period and Place: Research Methods in Historical Geography. Cambridge University Press.

- Bordens., Kenneth, S. & Bruce B. (2011) Research design and Methods, McGraw Hill, Singapore.
- Bridget, S. & Lewin, C. (Ed.) (2012) Theory and Methods in social Research, SAGE, London.
- Gomez, B. & Jones, J. P. (Ed.) (2010) Research Methods in Geography: A Critical Introduction, Wiley-Blackwell, UK.
- Howard, K. & Sharp, J A. (1983) The Management of a Student Research Project, Gower Publishing Company, UK.

Course Title: **Major-XI: Environmental Geography**
 Course Number: GEOG-321
 Credit Hours: 2+1 (3)

Learning Objective: To impart basic environmental knowledge to the students and enhance their awareness regarding global and local environmental issues.

Course outline:

- Introduction
- Evolution of Environmental Studies in Geography
- Comparative Advantage of Geography
- Concept of environmental management
- Environment and Man
 - Ecosystem and Resources, Important Cycles
 - Population explosion and human impact on the environment
- Environmental hazards
 - Geophysical, Quasi-Natural
 - Biological
 - Technological
- Human Response Parameters
- Risk assessment and perception
- Adjustment to Hazards
- Major Environmental hazards and Problems in Pakistan:
 - Floods
 - Earthquake; Tsunami
 - Cyclones, Landslides, Droughts
 - Deforestation and Desertification
 - Water-logging and Salinity, Soil Erosion
 - Environmental Pollution
 - Waste Management
- Control and Mitigation Measures
 - Technology, Awareness, Legislation, Ethics
- Pakistan Environmental Act
 - National Conservation Strategy
 - National Environmental Quality Standards

Lab. Work: to show the distribution different types of natural hazards on the map and temporal frequency on graphs

Field visits: of urban and rural areas to identify local environmental problems and documentation of these problems through GIS and SRS data

Books Recommended:

- Arms, K. (1991) Environmental Science, Asunders College Publishing: Philadelphia.
- Botkin, D. B. & Edward A. K. (2012) Environmental Science, John Wiley & Sons. Inc., Hoboken.

- Cunningham, W. P. (2007) *Environmental Science: A Global Concern*, McGraw Hill Higher Education, Boston.
- Enger, E. D. (2004) *Environmental Science*, McGraw Hill Higher Education, London.
- Marsh, W. M. & John, G. (2005) *Environmental Geography*, John Wiley & Sons, Inc. Hoboken.
- Raven., Peter, H. & Linda R. B. (2004) *Environment*, John Wiley & Sons, Inc., Hoboken.
- Weng, Q. (Ed.) (2011) *Advances in Environmental Remote Sensing*, Taylor and Francis Group, Boca Raton.
- Wright, R. T. (2008) *Environmental Science*, Pearson Prentice Hall, New Delhi.
- Lead, J. R. & Smith, E. (2009) *Environmental and human health impacts of nanotechnology*. John Wiley & Sons., New York.

Course Title: **Major-XII: Political Geography**
 Course Number: GEOG-322
 Credit Hours: 3

Learning Objective:

To highlight the political phenomena in geographical context. ii) To explore the geographical aspect in the emergence and growth of states, frontier and boundaries iii) To analyze and highlight the problem of Spatial and contemporary Political/Administrative Institutions and development.

Course Outline:

- Definitions, Introduction, scope and Status of Political Geography.
- Perceptions of Space, Territoriality and the Political World.
- The State: State, Nation, nation-State. The Emergence of States. Modern
- Theories about states. The Territory of the State. Frontiers and Boundaries.
- Core Areas and capitals. Unitary, Federal and Regional States. Anomalous Political Units.
- Power Analysis.
- Political Geography within the State: Internal functions of the state.
- Constituent parts of the state. Civil divisions and districts with special reference to the context of Pakistan.
- The Geography of Elections.
- Geopolitics: Historical concepts in Geopolitics. Contemporary Geopolitics.
- The Geography of War and Peace. Imperialism, Colonialism, Decolonization. The aftermath of colonialism.
- Contemporary International Relations: International Law. International Trade.
- Land-locked States. Intergovernmental Organizations.
- The law of the sea. The Political Geography of the Sea. Politics of population, Migration and Food.
- The Role of Political Geographers in the Future Outer Space.

BOOKS RECOMMENDED:

- MARTIN. J., R. JONES & M. WOODS (2004): *Introduction to Political Geography: Space, Place and Politics* Routledge. New York.
- CHUCK, F.M. & I. GLASSNER (2003): *Political Geography*. John Wiley; New York (3 Edition)
- KEVIN R. COX (2002): *Political Geography: Territory, State, and Society*. Blackwell Publishers
- AGNEW, J.A. & J. AGNEW (2002): *Making Political Geography (Human Geography in the Making)* Arnold Publishers. New York/London.
- PETER. T. & C. FLINT (1999): *Political Geography: World, Economy, Nation, State and Locality*. Prentice Hall; (4th Edition).
- GLASSNER, M.I (1995): *Political Geography*, 2nd Edition John Wiley and Sons, New York. (2nd Edition)

DIKSHIT, R.D. (1995): Political Geography. The Discipline & its Dimensions. Tata McGraw-Hill Publishing Company Ltd., New Delhi.

HUSSAIN MAJID (1994): Political Geography. Annual Publications Pvt. Ltd. New Delhi 110002.

GLASSNER, M.I (1993): Political Geography. John Wiley & Sons. Inc. New York.

TAYLOR PETER JAM (1993): Political Geography. Longman Scientific and Technical, Longman Group U.K. Ltd., Essex.

MUIR RICHARD (1987): Modern Political Geography.

MUIR, R. (1975): Modern political geography. Halsted Press

PRESCOTT, J.R.V. (1972): Political Geography. Richard Clay (The Chancer Press) Ltd. Bungay, Suffolk, U.K.

Course Title: **Research Project Report-I/Internship**

Course Number: PROJ-497

Credit Hours: 2+1 (3)

Course Outline:

- The research project is a major component of the programme in which the student will demonstrate an ability to independently integrate knowledge, skills and competencies acquired from all earlier courses, together with an opportunity to consolidate and develop additional skills in the use and application of research methodologies. This independent study will be defined in consultation with the course co-ordinator and will be based on:
- A specific research topic brought from the Remote Sensing & GIS industry. In this case, the topic will be discussed and finalized by mutual consultation of the corresponding industry, student and the 4-year BS Geomatics (GIS & RS) course coordinator of the University.
- A research project proposed by research supervisor or associate researchers within or outside the host university.
- A development from a guided project pursued in RS and GIS, Applied Remote Sensing or an idea developed by the student during the earlier taught parts of the course. In all cases, there will be a close liaison prior to, and during the project between the student, the course contributors and relevant industry organizations.
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Note: Research project is of 6 credit hours spread over two semesters i.e. semesters 7 and 8.

Course Title: **Major-XIII: Settlement Geography**

Course Number: GEOG-331

Credit Hours: 2+1 (3)

Learning Objective:

To explain the process of formation and development of human settlements and to enable students to develop an understanding regarding the processes of urbanization.

Course outline:

- Introduction
- Significance of settlement geography, basic definitions: Site and situation, hierarchy and types of settlements
- Rural settlements: Dispersed settlements, nucleated and ribbon settlements; their contrasts between More Developed Countries (MDCs) and Less Developed Countries (LDCs)
- Forms and patterns of settlements, house types and their evolution in rural areas
- Commercial functions of rural settlements and their role as a market town
- Infrastructure and services in rural settlements.

- Historical evolution of urban settlements, western and non-western urbanization, rural-urban fringe, suburbs and satellites
- Economic base, urban function and functional classification
- Towns and villages as central places
- Internal structure of the cities and land use pattern
- Theories of urban structure: Concentric Zone theory, Sector theory, Multiple Nuclei theory, and social area analysis,
- Urban development: slums and blighted areas.
- City-size, distribution, rank-size rule, primate city

Lab. Work:

Analysis of settlement types from topographic sheets, their centrality as population foci, urban areas etc.

Field Visit:

Field trips to study land use of major cities in Pakistan.

Books Recommended:

- Chisholm, M. (1982) Rural Settlements and Land use, Hutchinson University Library, London.
- Mayer, H. M. & Kohn, C. F. (1959) Readings in Urban Geography, University of Chicago Press, USA.
- Michael, P. (2002) Urban Geography. A global prospective, Rutledge, New York.
- Murphy, R. E. (1966) The American City: An Urban Geography. McGraw-Hill, New York.
- Neuwirth, R. (2004) Shadow Cities: A Billion Squatters, A New Urban World, Rutledge, New York.
- Pacione, M. (2009) Urban Geography-A Global Perspective. Third Edition. Routledge, London
- Rennie, J. & Short, P. (1992) Human Settlement (Illustrated Encyclopaedia of World Geography, Oxford University Press, Oxford.
- Robert, B. K. (1996) Landscapes of Settlements: Prehistory to Present, Rutledge, London
- Rykwert, J. (2004) Human Settlements, University of Pennsylvania Press, University Park, USA.
- UNDP, (1996) Living in Asian Cities, ST/ESCAP/1660 United Nations, New York.
- United Nation Centre Of Human Settlement (1996) An Urbanizing World: Global Report on Human Settlements. Oxford University Press, Oxford.
- Wood, M. (2005) Rural Geography: Processes, Responses and Experiences of Rural Restructuring, Sage Publication, London.

Course Title: **Major-XIV: Regions and Regional Concepts**
 Course Number: GEOG-332
 Credit Hours: 2+1 (3)

Learning Objective:

This course is framed to impart knowledge of the principles underlying the division of the world into geographic regions & to transfer knowledge of the characteristics of regions at global level

Course Outline:

- **Introduction to Regional Concepts**
 - Scope, Status, and the significance of the regional approach
 - Regional approach and its evolution
 - Criteria for dividing world into regions
- **Physical Attributes**
 - Location, Physiography,
 - Climate, Soils, Hydrology
 - Natural Vegetation
- **Economic attributes**
 - Human Resources,

- Mineral and Power Resources,
- Agriculture, Industry,
- Communication and Trade
- **Types of Regions**
 - Economic Regions
 - Political Regions
 - Physical Regions
 - Cultural Regions
 - Special Purpose Regions
- **Major Regions of the world**
 - Distinguishing characteristics
 - South Asia
 - South West Asia
 - Far-eastern regions
 - Western Europe
 - Russia and Central Asia
 - North Africa and Anglo-America
 - Other Regions
- **Role of the Region in Global Development**

Lab. Work:

Identification and delimitation of different types of regions on maps.

Books Recommended:

- Bradshaw, M. & White, G. W. (2007) Contemporary World Regional Geography: Global connections, local voices, McGraw Hill Higher Education. Boston.
- Deblj, H. J. D & Muller, P. O. (2011) The world Today: Concepts and Regions in Geography John Wiley & sons Inc., New York.
- Hobbs, J. (2010) Fundamentals of world regional 2nd edition, Cole Cengage learning: Australia.
- Knox, P. L. & Marston, S. A. (2003) Places and Regions in Global Context: Human Geography, Prentice Hall, New Jersey.
- James. & Preston, E. (1974) One World Divided. Prentice Hall, New Jersey.

Course Title: **Research Project Report-II/ Internship**
Course Number: PROJ-498
Credit Hours: 3

Learning Objective

To expose students to do practical work in a real world situation to bridge the gap between theory and practice by writing a report independently. Learn communication skills by presenting it in a seminar.

Internship project outline

Internship with any public, private sector, district governments, national /international organization, inter university linkages, academic and research institutions, NGO, CBO, CCBs or Group Survey with report and its presentation in a seminar.

Thesis Format:

- **Introduction**
 - Background
 - The Problem
 - Research Questions
 - Hypothesis

- Objectives
- Significance
- Historical Context

- **Methodological Framework**
 - Data Sources
 - Data Quality
- **Data Uncertainty and Limitations**
 - Methods
 - Techniques, Models, Sampling
 - Accuracy Assessments
 - Qualitative data (Questionnaire)
 - In-situ Observation (Field Records)
- **Review of Literature**
 - General, Issue Specific, Technique Specific
- **Results & Discussion**
- **Conclusion**
 - Suggestions/Recommendations
- **References**

ELECTIVE COURSES

Group 'A' Physical Geography

GEOG-341	Pleistocene Geomorphology	3
GEOG-342	Quaternary Geomorphology	3
GEOG-343	Coastal Morphology	3
GEOG-344	Fluvial Morphology	3
GEOG-345	Glaciology	3
GEOG-346	Geography of Arid Lands	3
GEOG-347	Soil Geography	3
GEOG-348	Meteorology	3
GEOG-349	Hydro-geography	3
GEOG-350	Plant Geography	3
GEOG-351	Zoo-Geography	3
GEOG-352	Climatic Change Studies	3
GEOG-353	Geophysics	3
GEOG-354	Geolithology	3

Group 'B' Human Geography

GEOG-361	Cultural Geography	3
GEOG-362	Social Geography	3
GEOG-363	Transportation Geography	3
GEOG-364	Urban Geography	3
GEOG-365	Rural Settlement Geography	3
GEOG-366	Agriculture Geography	3
GEOG-367	Urban and Rural Land Use	3
GEOG-368	Behavioral Geography	3
GEOG-369	Geography of Manufacturing	3
GEOG-370	Geography of Marketing	3
GEOG-371	Regional Planning	3
GEOG-372	Geography of Recreation and Tourism	3
GEOG-373	Gender Geography	3
GEOG-374	Medical Geography	3
GEOG-375	Industrial Geography	3
GEOG-376	Geography of Migration and Regional Development	3
GEOG-377	Historical Geography	3
GEOG-378	Geography of Nutrition	3
GEOG-379	Geography of Housing	3
GEOG-380	Geography of Crimes	3
GEOG-381	Geography of Religion	3
GEOG-382	Geography of Sports	3
GEOG-383	Geography of Resource Conservation	3
GEOG-384	Geo-Archaeology	3
GEOG-385	Geography of Prehistoric Cultures and Civilizations	3
GEOG-386	Anthropo Geography	3

Group 'C' Applied Geography

GEOG-401	Quantitative Geography	3
GEOG-402	Geography Of Natural Hazards And Disasters	3
GEOG-403	Applied Geomorphology	3
GEOG-404	Development Planning	3
GEOG-405	Sustainable Development Of Natural Resources	3

GEOG-406	Environmental Impact Assessment (EIA)	3
GEOG-407	Applied Cartography	3
GEOG-408	Applied Geography	3
GEOG-409	Social Impact Assessment (SIA)	3
GEOG-410	Mountain Geography	3
GEOG-411	Geography Of Retailing	3
GEOG-412	Urban Environmental Planning And Management	3
GEOG-413	Geography Of Wetlands	3
GEOG-414	Geography Of Urban Transportation	3
GEOG-415	Geography Of Eco-Tourism	3
GEOG-416	Geography Of Urban Tourism	3
GEOG-417	Geography Of Rural Tourism	3
GEOG-418	Urban Planning	3
GEOG-419	Urban And Landscape Ecology	3
GEOG-420	Geography Of Boundaries And Conflicts	3
GEOG-421	Natural Resources Research	3

Group 'D' Regional Geography

GEOG-431	Far East	3
GEOG-432	East Asia	3
GEOG-433	South And South East Asia	3
GEOG-434	South West Asia	3
GEOG-435	Central Asia	3
GEOG-436	Western Europe	3
GEOG-437	Eastern Europe	3
GEOG-438	North America	3
GEOG-439	Latin America	3
GEOG-440	North Africa	3
GEOG-441	Sub Saharan Africa	3
GEOG-442	Australia	3
GEOG-443	Muslim World	3
GEOG-444	Russian Federation	3

Group 'E' Geo-informatics

GEOG-451	Spatial Data Visualization	3
GEOG-452	Spatial Modeling	3
GEOG-453	Photogrammetry	3
GEOG-454	Spatial Data Infrastructure	3
GEOG-455	Cyber Geography	3

Group 'F' Techniques

GEOG-461	Mathematical Geography	3
GEOG-462	Geodesy And Advanced Surveying	3
GEOG-463	Computer Cartography	3
GEOG-464	Digital Cartography	3
GEOG-465	Advanced Quantitative Analysis	3
GEOG-466	Computer Modelling & Simulation	3
GEOG-467	Techniques In Geography	3