ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ
UNIVERSITY OF MYSORE

CBCS Framework for Master of Science (M.Sc.)

Subject: GEOGRAPHY

M.Sc in Geography

I to IV Semester Syllabus

2024-25 (Batch Onwards)

BOS Chairman

DOS in Geography, University of Mysore
Manasagangothri, MYSURU-570 006
KARNATAKA, INDIA

Department of Studies in Geography,

Manasagangotri Campus, University of Mysore

2024-2025

UNIVERSITY OF MYSORE

M.Sc. Geography

Modified Syllabus for the academic year 2024-25 (Onwards)

I Semester			
Paper	**Title of the Paper**	**L:T:P**	**Type**
H.C-1.1	Conceptual Development in Geography	3:0:0	HC
H.C-1.2	Principles of Geomorphology	3:0:0	HC
H.C-1.3	Techniques of Analysis in Physical Geography	0:0:3	HC
S.C-1.1	Tourism Geography	3:0:0	SC
S.C-1.2	Natural Resources Management	3:0:0	SC
S.C-1.3	Political Geography	3:0:0	SC
S.C-1.4	Social Geography	3:0:0	SC
S.C-1.5	Water Resources Management	3:0:0	SC
S.C-1.6	Geography of Settlements	3:0:0	SC
	Total Credits	**18**	

II Semester			
Paper	**Title of the Paper**	**L:T:P**	**Type**
H.C-2.1	Principles of Remote Sensing	3:0:0	HC
H.C-2.2	Remote Sensing Analysis	0:0:3	HC
H.C-2.3	Techniques of analysis in Human Geography	0:0:3	HC
S.C-2.1	Concepts of Geomorphology	3:0:0	SC
S.C-2.2	Research Methods in Geography	3:0:0	SC
S.C-2.3	Agricultural Geography	3:0:0	SC
S.C-2.4	Geography of Population Dynamics	3:0:0	SC
S.C-2.5	Bio Geography	3:0:0	SC
S.C-2.6	Thematic Cartography	3:0:0	SC
O.E-2.1	GIS & Remote Sensing	3:0:0	OE
O.E-2.2	Geography of Karnataka	3:0:0	OE
	Total Credits	**18**	

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III Semester			
Paper	**Title of the Paper**	**L:T:P**	**Type**
H.C-3.1	Principles of GIS	3:0:0	HC
H.C-3.2	Geospatial Analysis	0:0:3	HC
H.C-3.3	Advanced Surveying	0:0:3	HC
S.C-3.1	Transportation Geography	3:0:0	SC
S.C-3.2	Monsoon Climatology	3:0:0	SC
S.C-3.3	Environmental Geography	3:0:0	SC
S.C-3.4	Population Resources and Development	3:0:0	SC
S.C-3.5	Urban Geography	3:0:0	SC
S.C-3.6	Monsoon Climate And Fluvial Geomorphology	3:0:0	SC
O.E-3.1	Human Geography	3:0:0	OE
O.E-3.2	Physical Geography	3:0:0	OE
	Total Credits	**18**	

IV Semester			
Paper	**Title of the Paper**	**L:T:P**	**Type**
H.C-4.1	Economic Geography	3:0:0	HC
H.C-4.2	Multivariate Statistics	0:0:3	HC
H.C-4.3	Methods of Regional Analysis	3:0:0	HC
S.C-4.1	Disaster Management	3:0:0	SC
S.C-4.2	Regional Development in India	3:0:0	SC
S.C-4.3	Medical Geography	3:0:0	SC
S.C-4.4	Applied Climatology	3:0:0	SC
S.C-4.5	Applied Geomorphology and River Basin Planning	3:0:0	SC
S.C-4.6	Dissertation	0:0:3	SC
O.E-4.1	Geography of India	3:0:0	OE
	Total Credits	**18**	

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M.Sc. Geography

Annexure – I:

Old Syllabus (Till 2023-2024)

Paper	Title of the Paper	L:T:P	Type
I Semester			
H.C-1.1	Conceptual Development in Geography	2:1:0	HC
H.C-1.2	Principles of Geomorphology and Geology	2:0:2	HC
H.C-1.3	Principle of Remote sensing	2:1:0	HC
S.C-1.1	Tourism Geography	2:1:0	SC
S.C-1.2	Natural Resources Management	2:1:0	SC
S.C-1.3	Political Geography	2:1:0	SC
S.C-1.4	Social Geography	2:1:0	SC
S.C-1.5	Water Resources Management	2:1:0	SC
S.C-1.6	Geography of Settlements	2:1:0	SC
II Semester			
H.C-2.1	Remote sensing Analysis –(Practical)	0:0:3	HC
H.C-2.2	Principles of GIS	3:0:0	HC
H.C-2.3	Techniques of analysis in Human Geography	0:0:3	HC
S.C-2.1	Concepts in Geomorphology	2:1:0	SC
S.C-2.2	Research Methods in Geography	2:1:0	SC
S.C-2.3	Agricultural Geography	2:1:0	SC
S.C-2.4	Geography of Population Dynamics	2:1:0	SC
S.C-2.5	Bio Geography	2:1:0	SC
S.C-2.6	Thematic Cartography	2:1:0	SC
O.E-2.1	GIS & Remote Sensing	3:1:0	OE
O.E-2.2	Geography of Karnataka	3:1:0	OE
III Semester			
H.C-3.1	Geo-Spatial analysis (GIS- Practical)	0:0:3	HC
H.C-3.2	Methods of Regional Analysis	2:2:0	HC
H.C-3.3	Advanced Surveying	0:0:3	HC
S.C-3.1	Transportation Geography	2:1:0	SC
S.C-3.2	Monsoon Climatology	2:1:0	SC
S.C-3.3	Environmental Geography	2:1:0	SC
S.C-3.4	Population Resources and Development	2:1:0	SC
S.C-3.5	Urban Geography	2:1:0	SC
S.C-3.6	Fluvial Geomorphology	2:1:0	SC
O.E-3.1	Human Geography	3:1:0	OE
O.E-3.2	Physical Geography	3:1:0	OE
IV semester			
H.C-4.1	Economic Geography	3:1:0	HC
H.C-4.2	Multivariate Statistics	2:1:1	HC
H.C-4.3	Dissertation	0:0:5	HC
S.C-4.1	Disaster Management	1:1:0	SC
S.C-4.2	Regional Development Planning in India	1:1:0	SC
S.C-4.3	Medical Geography	1:1:0	SC
S.C-4.4	Applied Climatology	1:1:0	SC
S.C-4.5	Applied Geomorphology	1:1:0	SC
O.E-4.1	Geography of India	3:1:0	OE

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Annexure – I: Modification Abstract recommended by Board of Studies

I Semester			
Paper	**Title of the Paper**	**L:T:P**	**Modification**
H.C-1.1	Conceptual Development in Geography	3:0:0	
H.C-1.2	Principles of Geomorphology	3:0:0	Title Changed
H.C-1.3	Techniques of Analysis in Physical Geography	0:0:3	Newly introduced
S.C-1.1	Tourism Geography	3:0:0	
S.C-1.2	Natural Resources Management	3:0:0	
S.C-1.3	Political Geography	3:0:0	
S.C-1.4	Social Geography	3:0:0	
S.C-1.5	Water Resources Management	3:0:0	
S.C-1.6	Geography of Settlements	3:0:0	
	Total Credits	**18**	

II Semester			
Paper	**Title of the Paper**	**L:T:P**	**Modification**
H.C-2.1	Principles of Remote Sensing	3:0:0	Shifted from Semester I
H.C-2.2	Remote Sensing Analysis	0:0:3	HC
H.C-2.3	Techniques of analysis in Human Geography	0:0:3	HC
S.C-2.1	Concepts of Geomorphology	3:0:0	SC
S.C-2.2	Research Methods in Geography	3:0:0	SC
S.C-2.3	Agricultural Geography	3:0:0	SC
S.C-2.4	Geography of Population Dynamics	3:0:0	SC
S.C-2.5	Bio Geography	3:0:0	SC
S.C-2.6	Thematic Cartography	3:0:0	SC
O.E-2.1	GIS & Remote Sensing	3:0:0	OE
O.E-2.2	Geography of Karnataka	3:0:0	OE
	Total Credits	**18**	

III Semester			
Paper	**Title of the Paper**	**L:T:P**	**Modification**
H.C-3.1	Principles of GIS	3:0:0	Shifted from Semester II
H.C-3.2	Geospatial Analysis	0:0:3	HC
H.C-3.3	Advanced Surveying	0:0:3	HC
S.C-3.1	Transportation Geography	3:0:0	SC
S.C-3.2	Monsoon Climatology	3:0:0	SC
S.C-3.3	Environmental Geography	3:0:0	SC
S.C-3.4	Population Resources and Development	3:0:0	SC
S.C-3.5	Urban Geography	3:0:0	SC

S.C-3.6	Monsoon Climate And Fluvial Geomorphology	3:0:0	Change of Title
O.E-3.1	Human Geography	3:0:0	OE
O.E-3.2	Physical Geography	3:0:0	OE
	Total Credits	**18**	

IV Semester			
Paper	**Title of the Paper**	**L:T:P**	**Modification**
H.C-4.1	Economic Geography	3:0:0	HC
H.C-4.2	Multivariate Statistics	0:0:3	HC
H.C-4.3	Methods of Regional Analysis	3:0:0	Shifted from Semester II
S.C-4.1	Disaster Management	3:0:0	SC
S.C-4.2	Regional Development in India	3:0:0	SC
S.C-4.3	Medical Geography	3:0:0	SC
S.C-4.4	Applied Climatology	3:0:0	SC
S.C-4.5	Applied Geomorphology and River Basin Planning	3:0:0	Change of Title
S.C-4.6	Dissertation	0:0:3	Converted to SC from HC
O.E-4.1	Geography of India	3:0:0	OE
	Total Credits	**18**	

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FIRST SEMESTER

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UNIVERSITY OF MYSORE
Master of Science (M.Sc) in Geography
SEMESTER – I
COURSE-I: CONCEPTUAL DEVELOPMENT IN GEOGRAPHY

LEARNING OUTCOME:

- Understand the Historical Context of Geographical Thought
- Analyze Key Theories and Paradigms in Geography
- Explore Paradigm Shifts and Contemporary Trends
- Apply Philosophical and Methodological Approaches
- Engage with Major Geographical Traditions and Dualisms

PEDOGOGY:

To enhance the learning outcome of the course the discussion and interaction method shall be used where the facilitator make connections to students lives.

COURSE CONTENT:

Unit I: Foundations of Geographical Thought

1. Introduction to Geographical Thought
   - Definition and scope of geographical thought
   - Historical development and significance
2. Contributions of Ancient Geographers
   - Greek Scholars: Herodotus, Eratosthenes, Ptolemy
   - Roman Scholars: Strabo, Pliny the Elder
   - Arab Scholars: Al-Idrisi, Ibn Battuta, Al-Masudi
   - Chinese Scholars: Zhang Heng, Xu Xiake
   - Indian Scholars: Varahamihira, Al-Biruni, Kalhana
3. Medieval to Early Modern Geographical Thought
   - Transition from medieval to modern geography
   - Contributions of Renaissance scholars: Bernhardus Varenius, Immanuel Kant

Unit II: Classical to Contemporary Geographical Thought

1. Classical Geographical Thought
   - Alexander von Humboldt and Carl Ritter: Founders of modern geography
   - Environmental Determinism vs. Possibilism
2. 20th Century Geographical Thought
   - Richard Hartshorne and the concept of regional geography
   - Quantitative Revolution: Methods and impacts
   - Behavioral Geography: Humanistic and behavioral approaches
3. Paradigm Shifts in Geography

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- The influence of Darwinian thought on geography
- The rise of theoretical geography: Spatial analysis and modeling
- Critical Geography: Feminism, Marxism, and Postmodernism

4. Contemporary Trends in Indian Geography
   - Contributions of Indian geographers in modern times
   - Thematic and methodological advancements

Unit III: Philosophical and Methodological Perspectives

1. Philosophical Foundations
   - Positivism and Empiricism in Geography
   - Humanism and Phenomenology
   - Structuralism and Post-Structuralism
2. Methodological Approaches
   - Qualitative vs. Quantitative methods
   - Geographic Information Systems (GIS) and Remote Sensing
   - Participatory and community-based research methods
3. Geographical Traditions and Dualisms
   - Major geographical traditions: Earth science, human-environment interaction, spatial analysis, and area studies
   - Dualisms in geography: Physical vs. human, regional vs. systematic, idiographic vs. nomothetic

Unit IV: Systems Approach and Systems Analysis in Geography:

1. Introduction to System Approach to Geography
2. Systems Analysis: A. Basic elements – Inputs and outputs,Processors, control, Feedback, Environment, Boundaries and Interfaces,
3. Components of a System: A set of Elements, A set of Functioning Links, A set of links between System and external Environment.
4. Essential features- Environment of a system, The behavior of a system,
5. The state of a system, Organization and information in system, Structure of a system.
6. Common relationships, Classification of a system

References:

1. **Adhikari, S. (2014).** Fundamentals of Geographical Thought. Orient BlackSwan.
2. **Holt-Jensen, A. (1999).** Geography: History and Concepts. SAGE Publications.
3. **Peet, R. (1998).** Modern Geographical Thought. Blackwell Publishing.
4. **Hartshorne, R. (1959).** Perspective on the Nature of Geography. Rand McNally.
5. **Johnston, R., Gregory, D., Pratt, G., & Watts, M. (2000).** The Dictionary of Human Geography. Wiley-Blackwell.
6. **Dickinson, R. E. (1969).** The Makers of Modern Geography. Routledge.
7. **Husain, M. (2006).** Evolution of Geographical Thought. Rawat Publications.
8. **Harvey, D. (2000).** Spaces of Hope. University of California Press.
9. **Soja, E. (1989).** Postmodern Geographies: The Reassertion of Space in Critical Social, Theory. Verso.
10. **Cloke, P., Crang, P., & Goodwin, M. (2004).** Envisioning Human Geographies. Arnold.

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Master of Science (M.Sc) in Geography

SEMESTER – I

COURSE-II: PRINCIPLES OF GEOMORPHOLOGY

LEARNING OUTCOME:

- Students are able to understand the Geological Time Scale and the age of the earth.
- Students will be in a position to distinguish between old and recent rock formations
- Student can analyze and recommend the different forms of Stratigraphy.
- Possible to identify the causes of Structutral deformation of rocks through different laws of stratigraphy and Unconformity.
- Able to explain the cause of Plate Movement, Plate Tectonics and associated land deformations
- Can apply geological criteria in Ground Water Mapping, Flood analysis, Watershed Management and Different types of Disaster Management.

PEDOGOGY:

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and laboratory methods shall be adopted.

COURSE CONTENT

Unit I: Principles of Geomorphology

1. Importance of structural geology
2. Geological timescale,
3. Interior of the earth,
4. Stratigraphy: Law of stratigraphy, Horizontality, superposition, lateral continuity, law of magnetic concentration,
5. Dendro Chronology and Dendro Climatology, Forms of Stratigraphy.
6. Chronological stratigraphy
7. Litho stratigraphy
8. Bio stratigraphy
9. Magneto stratigraphy
10. Seismic Stratigraphy
11. Dendro climatology

Unit II: Isostasy

1. Views of Prat, Airy and Bowie
2. Concepts of Earth's Equilibrium and Gravity Anomaly
3. Plate tectonics: development of plate tectonic theory, Major and Minor plates

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4. Plate movement and forces, convectional current, inner core current, thermal flumes.
5. Plate Margins and Associated Landforms, Validation of Plate Tectonics

Unit III: Structural Deformations

1. Structural Stress, Strain
2. Anticline Folds and syncline folds.
3. Causes for Sinking and Uplifting of lands.
4. Impact of Faults and Lineaments on Fluvial Landforms.
5. Impact of Land slides on Geomorphological conditions of a region
6. Impact of Earthquakes on the Surrounding Landforms according to the magnitude.
7. Indicators of Structural Deformation Conformities and unconformities, Disconformity, Unconformity, Angular Disconformity

Unit IV: Geological Structures

1. Major Geological Structures of India
   - Himalayan Geology- Greater, Middle and Lower,
   - Indo Gangetic Plains
   - Peninsular India
2. Major Geological Structures of Karnataka.
3. Geological Structures of River Basins of Karnataka.

References:

1. 3-D Structural Geology: A Practical Guide to Quantitative Surface and Subsurface Map Interpretation by Richard H. Jr. Groshong (Hardcover – Jul 24, 2008).
2. Basic Methods of Structural Geology by Stephen Marshak and Gautum Mitra (Paperback - April 4, 1988)
3. Earth Structure: An Introduction to Structural Geology and Tectonics (Second Edition) by Stephen Marshak and Ben A. van der Pluijm (Hardcover - Dec 29, 2003)
4. Fundamentals of Structural Geology by David D. Pollard and Raymond C. Fletcher (Hardcover - Sep 19, 2005)
5. Structural Geology by Robert J. Twiss and Eldridge M. Moores (Hardcover - Dec 15, 2006)
6. Structural Geology of Rocks and Regions, 2nd Edition by George H. Davis and Stephen J. Reynolds (Hardcover - Jan 19, 1996)

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UNIVERSITY OF MYSORE

Master of Science (M.Sc) in Geography

SEMESTER – I

COURSE-III: TECHNIQUES OF ANALYSIS IN PHYSICAL GEOGRAPHY (PRACTICAL)

LEARNING OUTCOME:

- Are expected to extract the relief characteristics of a place using different techniques.
- Are able to analyze the influence and interrelation of natural forces like the surface drainage and slope factors and the structural characteristics of the earth's interior on the physical construct of a place.

PEDOGOGY:

As this course is practical and lab oriented, it focuses on skill enhancement in addition to the conceptual base among the learners. Hence, the course shall adopt observation method through field studies and laboratory methods shall be adopted.

COURSE CONTENT

Unit I: Percent, Angle of the slope. Conversion of Slope values, Construction of Slope Maps using Grids, Wentworth Method, Dhurandhar Method and Smith Method, Altimetry frequency analysis, Hypsometric analysis.

Unit II: Morphometric 'analysis: Stream Order analysis, Bifurcation ratio analysis, Sinuosity Index, Drainage Density analysis, Drainage Frequency analysis, River Flow analysis, Rainfall discharge relationship

Unit III: Geological Maps: Meaning Importance, Important Concepts like, Dip, Direction and angle. Plunge Lines, Strike Lines, Folds, : Cylindrical and Non Cylindrical Folds, Geometrical Features of folds, Faults: Fault Planes, Slip and Separation, Classification of fault based on slip

Unit IV: Unconformity: Types of Conformity - Overstep and Overlap Unconformity

Reference

1. R.L Singh: Elements of practical Geography, Kalyani Publications. 2005
2. RP. Mishra: Fundamental Cartography, Concept publication, New Delhi. 2001
3. R.Hammond and P.Mecullagh: Quantitative techniques in Geography. Claredon press, oxford. 1975.
4. Anson R.W and Colour use guidelines for mapping and visualization **"**visualization in modern Geography**"** Oxford.

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SEMESTER – I
COURSE-IV: TOURISM GEOGRAPHY

LEARNING OUTCOME:

- Able to acquaint with the concept, types and factors influence on tourism.
- in a position to understand the organizational structure of travel agencies and types of travel agents based on different criteria.
- will understand the components of tour package and its types along with the travel and accommodation.
- in a position to draw Comprehensive place specific sustainable tourism plans and policy without harming to the environment.

PEDOGOGY:

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

COURSE CONTENT

Unit – I: Nature, Scope, Definition & importance of Tourism, Approaches to the study of Tourism, Types of Tourism, Types of Tourist, Factors affecting Tourism (Tourist attraction)

Unit – II: Tourism Motivations, Tourist Behavior, Travel Agencies, Types of travel agents & tour operators. Organizational structure of travel agencies. Membership & Types, Organizational structure of IATA Rules & conditions for Recognition of Travel Agency.

Unit- III. Tour packaging – Definition, Components, types of package tour & Tour package – Designing & Developing Process, Destination & Market & Demand & Dimensions of Tourism. Tourism and GPS.

Unit- IV. Travel & accommodation: Structure of accommodation. Travel & Transport – Modes of Transport, Tourism Planning & Environment.

Reference

1. Rana Pratap and Kamala Prasad (2003) **"**Tourism Geography**"** Shree Publishers and Distributors, New Delhi.
2. Krishan K.Kamra & Mohinder chan (2006) basics of Tourism theory, operatuion & practice, Kanishka publishers New Delhi.
3. Batta.N (2004), **"**Tourism and the Enronment**"** Indus Book, New Delhi.
4. Bhatia A.K (2006) The business of Tourism concepts & stratergies, sterling publishers prorate limited, New Delhi.
5. Bhardwaj, Kandan and Choudary (2004), **"**Domestic Tourism in India**"** Indus Books.

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SEMESTER – I
COURSE-V: NATURAL RESOURCES MANAGEMENT

LEARNING OUTCOME:

- Understand concepts of different natural resources, its use, overuse, with its solution by natural resource management methods.
- Appreciate the need for managing land and water resources for sustainable growth and development, managerial skills such as land evaluation and land classification.
- Also able to understand the causes and consequences of water stress and draw water conservation and management plans.

PEDOGOGY:

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

COURSE CONTENT

Unit- I: Concept of Resources- Meaning, Definition, importance and classification of Resources, Appraisal of Natural Resources, Natural Resources Economics, History of Conservation, need for conservation and Management of Natural Resources –Role of Government and NGO Agencies, Resource Creating Factors. Environmental Risk- types, wildlife, forest risk and its impact on environment and its management.

Unit- II: Land Resources-Land Evaluation Methods, Land classification Methods, Land use and Land cover Mapping changes. Issue related to land use change –Land use and population, Land use pattern in the world. Land source at stress, land use planning and development. Soil erosion, soil degradation, methods of conservation.

Unit-III: Water Resources- Importance of water, Recent trends in water use in the world and in India, water crises, (stress) causes and consequences of water stress or crises , methods of water conservation, watershed management, coastal and ocean Resources management, Fisheries Management.

Unit-IV: Minerals Resources: types of minerals, classifications of Major Minerals, their distribution and production. Such as Petroleum, Coal, Iron ore, Bauxite and Copper etc, and its uses. Mineral exploration methods, Mining and its effects on environment. Minerals conservation and mining policy.

Reference:

1. Dr.Alka Gautham: Geography of Resources: Exploitation, Conservation and Mangement, Sharada Pustak Bhavan, Allahabad.
2. Dr.P.S.Negi: Geography of Resources: Kedarnath Ramnath Publishers, New Delhi
3. Dr.Rajashekara Shetty(2009): An Analysis of World Resources with reference to India, Sarala Raj, Ria Publishers, Mysore
4. Khanna K.K and Gupta V.K.(1993): Economic and Commercial Geography, Sultan Chand, New Delhi
5. Prof. Zimmerwan – World Resources and Industries
6. Roy, P.R(2001) Economic Geography – A Study of Resources, New Central Book Agency, Calcutta.

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SEMESTER – I
COURSE-VI: POLITICAL GEOGRAPHY

LEARNING OUTCOME:

- will be knowing the role of geography in the global politics
- will able to analyze the present global political situation
- will be able to differentiate the State, Nation and Nation State.
- will be in a position to carry on research Strategies compatible to the present technological development.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt project and discussion methods. The observation method through print and electronic media shall be adopted.

COURSE CONTENT

Unit – I: Concept of state and nation's state i) Spatial factor of state ii) Frontiers and Boundary

Unit – II: Concepts of geo-politics and models of geo-politics i) Rim land ii) Hear land theory model iii) Sea Pointer nodal iv) Territorial Sea and Maritime Boundaries

Unit – III: Geo – politics and world organization i) UNO ii) WHO iii) IMF iv) ADB v) WB vi) FAO

Unit – IV: Global politics and global strategy i) Pre – world war period ii) Post – world war period iii) Post – communist downfall geopolitics iv) Post – global economic change geopolitics

Reference

1. Australia and the Insular Imagination: Beaches, Borders, Boats, and Bodies by Suvendrini Perera (Hardcover - Oct 27, 2009)
2. States of Emergency: The Object of American Studies by Russ Castronovo and Susan Gillman (Hardcover - Nov 15, 2009)
3. The Impact of 9/11 on the Media, Arts, and Entertainment: The Day that Changed Everything? by Matthew J. Morgan and Rory Stewart (Hardcover - Nov 24, 2009)
4. The 2008 Presidential Elections: A Story in Four Acts by Erik Jones and Salvatore

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UNIVERSITY OF MYSORE
Master of Science (M.Sc) in Geography
SEMESTER – I
COURSE-VII: SOCIAL GEOGRAPHY

LEARNING OUTCOME:

- Understand various Philosophical basis of social Geography and are able to identify the philosophical background in each argument of social concepts.
- get knowledge about different tribes, languages, religions from spatial and social perspective.
- be able to differentiate space types and appreciate the social relations and Interactions in society.
- Understand about various social structures and social segregation.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

COURSE CONTENT

Unit-I: Nature, scope and development of social Geography, Social structure, Social process and Elements of Social Geography: ethnicity, tribe, dialect, language, caste and religion.

Unit-II: Conceptual and methodological approaches in Social Geography, Philosophical basis of Social Geography Positivism, Humanism, Idealism, Phenaminalism, Existentialism, Structuralism and Radicalism. .

Unit-III:. Space and Society, Individual's space, Intimate, Personal Public and social space, Spatial Interaction and Social relations, Theoretical space organic, perspective and symbolic space, Interaction and social relations

Unit-IV: Social Groups, Primary and Secondary Groups, Social Structure, Models of Assimination and Segregation. Social Wellbeing, Concepts, Components and Indicators of measurement of social wellbeing. Patterns of social wellbeing in world and India.

References

1. Anand Aijazuddin(1999) : Social Geography, Rawat publications, New Delhi.
2. Bulsara J.F(1970) : patterns of social life in metropolitan areas , Popular Prakashan Bombay.
3. Orang Mike (1998) Cultural Geography,Routledge Publication London.
4. Dubey, S.C (1991) Indian Socity, National bank Trust, New Delhi.
5. Gergom. D and Lassy J (1985): Social relations and spatial structure Mcmillan.
6. Messey D et all (Eds) 1999: Human Geography today, policy press Combridge.
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UNIVERSITY OF MYSORE
Master of Science (M.Sc) in Geography
SEMESTER – I
COURSE-VIII: WATER RESOURCES MANAGEMENT

LEANING OUTPUT:

- Understand the linkage between the Atmospheric and hydrological system and water conservation strategies.
- Be able to assess the critical relation between surface and subsurface discharge and recharge of water and its relation with water table.
- Be able to know various water shed management strategies through applying different techniques and Approaches.
- Gain knowledge on the impact of irrigation, Industrialisation and urbanization on water resources and contemporary water crisis.

PEDOGOGY:

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted**.**

COURSE CONTENT

Unit I: Hydrological Science

a) Importance of Water, Physical and Chemical properties of Water
b) Hydrological cycle and Water balance

Unit II: Atmospheric Relationship of Water

a) Precipitation and Evaporation; Storage and Runoff
b) Stream flow Analysis and Modelling, Water quality

Unit III: Water and Environment

a) Domestic and Nondomestic use of water;
b) Water pollution: Causes, Consequences and Measures
c) Water policies: National and International, conservation of water resources

Unit IV: Water Resources Management

a) Hydrology and Change: Climate Change, Change in Landuse
b) Groundwater Depletion and Urbanization
c) Sustainable Water Resources Management

Reference

1. Bruce J.P. & R.H. Clerk, Introduction to hydrometeorology, pergamon press, Oxford, 1996.
2. David Keith todd, Ground water hydrology, John Willy and sons, New York, 1959.
3. Robert J. Reimold, watershed management, practice, policies and co-Ordination, McGraw-Hill, New Delhi, 1998.
4. B.D.Dhawan, Indian water resource management for Irrigation : Issues Critiques reiews, Commonwealh publishers, New Delhi, 1993.
5. Ravi Misra, Fresh water Environment, Anmol publication pvt.LTD, New Delhi, 2002.

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SEMESTER – I
COURSE-IX: GEOGRAPHY OF SETTLEMENTS

LEARNING OUTCOME:

- Will be able to acquaint with the spatial and structural characteristics of human settlement system
- Under varied environmental conditions.
- Are able to distinguish the morphological, structural and functional characteristics between
- Rural and urban settlements both in Indian and western perspectives.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

COURSE CONTENT

Unit-I. Concept of rural and urban settlements; Nature, Scope, Significance and Recent Trends in Settlement Geography. Evolution of Settlements in India: Emergence of Village Settlements; rural settlement patterns, Origin and Growth of Towns; Basic and Non-Basic Concepts in Settlement formation. Distribution of Settlements, Spacing of Settlements –Application of Models of Christaller and Losch.

Unit-II. Rural Settlements Types & patterns of Rural Settlements, House Types, Morphology and Functions of Rural Settlements; Rural Service Centers and their Role in Urbanization Process. Indian Rural Settlements in Different Micro-Environmental Conditions: (a) Mountains (b) Desert Region (c) In the vicinity of Urban Centers.

Unit-III. Urban Settlements: Urban morphology, sphere of urban influence, Classification of Urban Places, Non-Functional and Functional. Morphology of Indian Cities and Its Comparison with Western Cities; Functional Relations between Urban Settlements and their umlands. Settlement systems- primate city, rank-size rule, settlement hierarchy.

Unit-IV. Theories in Settlement Geography –CBD, Centrifugal and centripetal forces theory, Urban Fringe, Urban structures theories. Rank size relationship. Settlement Geography of selected Indian Cities: Mumbai, Kolkata, Bangalore, Delhi, Chennai, Hyderabad, Pune, Laknow, Patna, Jaipur and Chandighar. Urban development in India.

References

1. Ambrose, Peter, 1970: Concepts in Geography, Vol.-I, Settlement Pattern, Longman.
2. Hudson, F. S. (1976) Geography of Settlements, Macdonald, London.
3. King, Leslie, J., 1986: Central Place Theory, Saga Publications, New Delhi.
4. Mayer, M. Harold and Clyde F. Kohn (Ed.) 1967 Readings in urban Geography, Central Book Depot, Allahabad.
5. Mitra, Asok, Mukherjee S and Bose, R., 1980: Indian Cities Abhinav Publications, New Delhi.
6. Nangia, Sudesh, 1976: Delhi Metrpolitan Region, K.B. Publications, New Delhi.
7. Northam Ray, M. (1979). Urban Geography, JohnWiley and Sons, New York.
8. Ramachandran, R., 1992: Urbanisation and Urban Systems in India, Oxford University Press, New Delhi.
9. Singh, R. L. and Kashi Nath Singh (Ed.) 1975: Readings in Rural Settlement Geography, National Geographical Society of India, Varanasi.

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SECOND SEMESTER

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UNIVERSITY OF MYSORE
Master of Science (M.Sc) in Geography
SEMESTER – II
COURSE-I: PRINCIPLES OF REMOTE SENSING

LEARNING OUTCOME:

- Understand the principles and physics of remote sensing.
- Know about the various agencies which are involved in the remote sensing business, which kind of sensor systems and resolution of data is collected by each of these agencies, etc.
- Get practical exposure to some fundamental exercises involved in this course on some simple methods of spatial analysis
- Understand application of remote sensing in the various field of science and social science

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through remote sensing technologies and case studies.

COURSE CONTENT

Unit I: Basics and Fundamentals of Remote sensing

a) Basics of Remote Sensing: Source of Energy, EMR (Electromagnetic Radiation)-characteristics of EMR and Electromagnetic Spectrum, EMR interaction with atmosphere and Earth's surface feature, Spectral Reflectance Curve
b) Image: Meaning and Characteristics, Platforms and Scanners system: Types and Geometry, Sensors: Types and resolutions
c) Scanners: Panchromatic (PAN), Multispectral scanners
Study on important satellite/sensors: Landsat, SPOT, IRS, and Sentinel.
d) Hyperspectral remote sensing and study of Important Hyperspectral Images (MODIS, AVIRIS)

Unit II: Microwave and Thermal Remote Sensing

a) Basic principles and Characteristics of Microwave Remote Sensing
b) Geometry of RADAR, SAR and SLAR
c) Important allocation of microwave remote sensing
d) Importance and Applications of Thermal Remote Sensing

Unit III: Digital Image Processing and Image Classification

a) Basics of Photography and Image, Atmospheric Error, Radiometric and Geometric correction
b) Spatial and Spectral enhancement, Image classification (Unsupervised and Supervised)

Unit IV: Application of Remote Sensing

a) Geology and Mineral extractions
b) Urban planning, Disaster and Forest Management
c) Glacier and Ocean resources exploration
d) Agriculture and Space Application

Reference

1. **B. Bhatta:** 'Remote Sensing and GIS'. Oxford University Press
2. **Jensen, John R., 2005:** Introductory Digital Image Processing, 3rd Ed.
3. **John R. Jensen:** Remote sensing of the Environment. Pearson education publication.
4. **M. Anji Reddy:** 'Remote Sensing and Geographical Information Systems'. BS Publication.
5. **W. H. Bakker et al** 'Principles of Remote Sensing – An Introductory Textbook'.

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SEMESTER – II
COURSE-II: REMOTE SENSING ANALYSIS (Practical)

LEARNING OUTCOME:

- Understand the principles and physics of remote sensing.
- Know about the various agencies which are involved in the remote sensing business, which kind of sensor systems and resolution of data is collected by each of these agencies, etc.
- Get practical exposure to some fundamental exercises involved in this course on some simple methods of spatial analysis
- Understand application of remote sensing in the various field of science and social science

PEDOGOGY

Remote Sensing Technology is applied to problems and issues in sustainable development. Remotely sensed data are manipulated for feature extraction, spatial analysis and raster based GIS modelling.

Objective

Unit I: Data Acquisition: Obtaining multi-spectral data, microwave data, thermal data from various satellites sensors like Landsat, IRS, SPOT, MODIS Terra/Aqua, NOAA; obtaining elevation data from Cartosat - I, SRTM, ASTER, Topographical Maps and GEBCO, study of histograms and layer information's.

Unit II: Data Preprocessing: Atmospheric Correction – Haze Removal - Image enhancement - contrast manipulation, density slicing, and color coding, image rectification: noise removal, radiometric correction, spatial correction, spectral correction, pan sharpening; geometric correction; image registration, subset, mosaic of side lap and overlap images.

Unit III: Classification and Delineation: Determination of land use classes and various classification scheme; Unsupervised – K Means, ISODATA; Supervised classification – training sets, Parametric and Non-Parametric rules; Object based classification; Visual Image Interpretation; Accuracy assessment – Confusion matrix, Kappa – coefficient, thematic mapping.

Unit IV: Modelling – Change Detection, terrain modelling and analysis, indices modelling - DVI, NDVI, SAVI, MSI, NDBI, NDWI; building of model using model maker – Tasseled Cap Transformation (Brightness, Wetness and Greenness), land surface temperature.

REFERENCES

1. Introduction to Remote sensing and Image interpretation- Lilesand and Keifer
2. Introductory Remote Sensing- Paul. J. Gibson
3. Fundamentals of Remote Sensing and Air Photo Interpretation -Avery, T.E.
4. Introduction to Remote Sensing -James B. Campbell
5. Remote Sensing and Image Interpretation -Lillesand, T.M. &R.W.Kiefer.

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SEMESTER – II
COURSE-III: TECHNIQUES OF ANALYSIS IN HUMAN GEOGRAPHY (Practical)

LEARNING OUTCOMES:

- Be able to know and apply different methods of geographical analysis like- Nearest Neighbour Analysis, Rank Size Rule, Gravity model, Detour index etc- which will help them to understand the applicability of the subject apart from theoretical knowledge.
- Able to estimate the amount of disparity in physical and social aspects with different methods like Kendall's method, Bhatia's method which help students to learn more about economic disparity in society.
- Be able to identify Different types of connectivity index like Alpha index, Beta index and Gama index which helps in the study of traffic flow and connectivity.
- Know the concept of accessibility in Geography.

PEDOGOGY

As this course is practical and lab oriented, it focuses on skill enhancement in addition to the conceptual base among the learners. Hence, the course shall adopt observation method through field studies and laboratory methods shall be adopted.

COURSE CONTENT:

Unit I: Nature of Geographical Data. Need for quantitative techniques in geography and limitations of these techniques. Measures of point distribution – centrality index; Central location- Median Centre, Mean Centre, Central location by formula method; Measures of dispersion of point, Dispersion about the median or mean canter, Dispersion about some other specific location, Dispersion of point in relation to each other.

Unit II: Nearest neighbor analysis, Rank size Rule, Gravity model; Measures of line distribution, Accessibility of nodes. Route density, Route sinuosity, Detour index, shortest path and shortest distance analysis, Traffic flow, Measure of connectivity- Beta index, Connectivity, Gama index, Cyclomatic number, Alpha index, Eta index.

Unit III: Measures of Area Distribution. Lorenz curve, Gini-coefficient, Index of dissimilarities and Similarities, Location Quotient, Index of concentration, Gibbs Martin index, shift-share analysis

Unit IV: Measures of Disparities – Kendall's method, Bhatia's method; Combinational analysis - Weaver's method, Ternary diagram.

References

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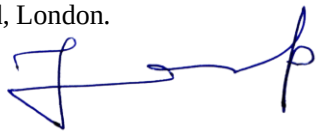
2. R.B. Mandal (2005) – Introduction to Rural Settlement, Concept Publishing Company, New Delhi.
3. R. Hammand and P. Mcchllagh (1975) – Quantitative Techniques in Geography, Clarendon press, Oxford.
4. J.P. Cole and C.A.M. King (1968) – Quantitative Geography, John Willey & sons Ltd, London.



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SEMESTER – II
COURSE-IV: CONCEPTS OF GEOMORPHOLOGY

LEARNING OUTCOME:

- capable of interpreting as well as analyzing various landforms in accordance to its location and situation
- capable to design urban planning, agriculture planning, disaster Management and regional planning
- in a position to identify underground water points
- capable of building paleo climates using Geomorphologic Signatures
- Have good command on water resource management

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and laboratory methods shall be adopted.

COURSE CONTENT

Unit-I:

1. Evolution of Geomorphology
2. Fundamental Concepts of Geomorphology- Ten Concepts of Thornbury
3. Cycle concepts, Views of W.M.Davis,Penk

Unit-II:

1. Glacio Fluvial Geomorphology of Himalayan region
2. Fluvial Geomorphology of Indo-Gangetic Plains
3. Arid Geomorphology of Thar Region
4. Fluvial Geomorphology of Seasonal rivers of Peninsular Region
5. Oceanic Geomorphology of Coastal Region
6. Geomorphology of Himalayas and Ajantha, Elora and Bora Regions.

Unit-III:

1. Weathering Process and Mass Wasting Process of Formation of Slopes and Forms of slopes.
2. Soil Formation Process Soil Profile
3. Zonal and Intra zonal Soil. Origin of Epeirogenic and Endogenic landforms

Unit-IV:

1. Application of GIS and Remote Sensing In Study Geomorphology Applications of Geomorphology in Planning: Geomorphology and Regional Planning, Geomorphology and Urban Planning, Geomorphology and Disaster Management

References

1. Thornbury William., 1954, “Principles of Geomorphology”, Wiley Eastern Limited, New Delhi.
2. Dogulas W.Burbank and Robert S. Anderson., 2001, “Tectonic Geomorphology”, Backwell, Science Inc., USA.
3. John R.Hails., 1977, “Applied Geomorphology” Elsevier Scientific Publishing Company, New York 10017.

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SEMESTER – II
COURSE-V: RESEARCH METHODS IN GEOGRAPHY

Learning Outcome:

- Define research problem and Interpret as well as analyze various physical and social issues in
- Geographical research perspective.
- Prepare research and sampling design and gather, analyse varieties of data.
- be in a position to handle independent research and case studies
- Conduct fieldwork with special emphasis on interviews and observations.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and laboratory methods shall be adopted.

COURSE CONTENT

Unit-I: Research Methodology: Meaning –Need for Scientific research Type of research-Approaches to geographical research: Defining the Research problem Ethics in Scientific Research Role Information Technologies in Research.

Unit-II: Research design: Concepts relating to research design, Different type of Research design. Experimental and Non-Experimental Research Designs Sampling design: Need for Sampling Methods, Size of Sampling; Measurement and Scaling Techniques,

Unit-III: Data Acquisition and Analysis; collection of data- sources of data- primary and secondary-Processing-editing, Coding, Classification and Tabulation, Analysis- data transformation-SPSS package in data analysis Data Display: Tables, Graphs, Maps, Visualizations

Unit-IV: Interpretation and Report Writing: meaning, techniques and significance of report writing-Drafting of the thesis-First, Second and Final- Writing of abstracts, Research papers for seminar and conferences, Journal Publications, case studies.

References

1. Anderson, J. Durston, B.H. and Poole, M,(1970) Thesis and Assignment Writing, Wiley Eastern Ltd, New Delhi.
2. Cooray, P.G (1992) Guide to Scientific and Technical Writing, Handagala, Srilanka
3. Davis J.C. (1986) Statistics and data Analysis, John Wiley and Sons NY.
4. Fitz Gerald, B.P. Ed (1974) Science in Geography, Series 1, 2, 3,4,5,6. Oxford University press, London
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6. Kothari, C.R. (2015) Research methodology: methods and Techniques, Vishwaprakashana, New Delhi.

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SEMESTER – II
COURSE-VI: AGRICULTURAL GEOGRAPHY

LEARNING OUTCOME:

- Understand origin, diffusion and classification of agriculture at the global scale.
- Familiarize with a variety of factors influence agriculture and agricultural models
- Acquire different tools and techniques of agricultural regionalization based on crop combination,
- crop concentration and crop diversification methods

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

COURSE CONTENT

Unit- I: Nature, Score & Significance of Agricultural Geography, Origin and Diffusion of agriculture and approaches to the study of agriculture geography .World classification of agriculture bases for the whitllesey.

Unit- II: Determinants of agriculture: Physical, Economic, Social, Institutional, Technological, Green Revolution, White Revolution and Blue Revolution.

Unit- III: Models in Agricultural Geography – Nature and Need of models, Significance of Agricultural models, Limitation of models, Classification of models, Input, output/Decision making/Diffusion/Von Von Thunen's Model, Olaf Jonasson's model and Game Theory.

Unit- IV. Agricultural Regionalization: Delimitation of Agricultural regions, Empirical/single Element/Multi-Element or statistical/Quantitative-cum- Qualitative Technique, Methodology for agricultural regionalization Cropping Pattern/Crop concentration, Crop combination Crop Diversification & Agricultural productivity.

Reference

1. Majid Hssain, (2002)**"** Systematic Agricultural Geography**"** Rawat Publication, Jaipur& New Delhi.
2. Noor Mohammed, **"**Perspectives in Agricultural Geography**"**, Vol. I to II, concept publishing company, New Delhi.
3. Sing and Dhillin, (2000) **"**Agricultural Geography**"**, Tata Mcgrow – Hill publishing company ltd, New Delhi.
4. Jasbir Sing, **"**Agricultural Geography**"**
5. M.Shafi,(2006) **"**Agricultural Geography**"** Dorling Kindersly (India) pvt, ltd, Licensees of Pearson Education in South Asia. New Delhi.

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SEMESTER – II
COURSE-VII: GEOGRAPHY OF POPULATION DYNAMICS

LEARNING OUTCOME:

- Understand different components of population dynamics such as Fertility and Mortality
- Get idea about Life Table construction, migration types and its issues such as Brain drain etc.
- Apply the theory of Demographic Transition and identify the stages of different regions of the world and its implications on them.
- Understand population policies of LDC's and MDC's comparing India and neighboring China.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

COURSE CONTENT

Unit-I: Population dynamics and components of population dynamics. Fecundity and fertility, Measures of fertility determinants of fertility, world's pattern and trend; Theories of fertility - Fertility in India, trend and spatial patterns.

Unit-II: Mortality – morbidity: Measures, determinants world's pattern and trend; Mortality in India-trend and patter; Life table construction. Migration- measures, theories of migration; International migration – past and present trend. Migration in India, trend and pattern, problem of Brain drain and impact.

Unit-III: Population growth stepped and exponential growth and demographic transition. Population growth and Boserup theory, Malthusian trop. India and demographic transition. Economic implications of Demographic transition with reference to India. Current demographic status in MDCs and LDCs.

Unit-IV: Population policies and population projections. Population policies – importance, various aspects of population policy. Policies in LDCs and MDCs. India's population policy, China's policy. Methods of population projections.

Reference

1. Asha A.Bhende & Tara Kanitkar – Principles of population studies, Himalayan publishing House, New delhi.
2. R.C.Chadana (2017) a geography of population, Kalyani publisher, New Delhi.
3. Mohammad Izhar Hassan (2005)- population geography, Rawat publication, Jaipur.
4. R.K.Tripati (2000)-population geography, commonwealth publisher, New Delhi.
5. Hornby & Jones (1983)-An introduction to principle Geography, Cambridge University press, London.
6. Majid Husain (1994)-Human Geography, Rawat Publication, Jaipur.
7. Dina Nath Verma (1992)-population patterns, Jaitosh Prakashan, Lucknow.

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COURSE-VIII: BIO GEOGRAPHY

LEARNING OUTCOME:

- Understand the interplay between the physical and biotic environment and its role on dispersal of organisms.
- Learn various aspects of adaptation of organisms, abundance, rarity of community of species and ecosystems interaction in a geographical space based on various parameters.
- Appreciate the importance of the concept of Bio diversity and causes for bio diversity loss.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

COURSE CONTENT

Unit-I: Nature, scope and significance, Branches of Bio Geography, Historical Development, Approaches to Bio Geography, Plant Geography and Zoo Geography, Eco-system structure function and development of Eco-system.

Unit-II: Geography of Animals communities, classification origin and Evolution of Animals, Dispersal of animals, Zoo Geographical Regions of the World, Environmental adaptations of animals. Factors influencing world distributions of Animals, anthropogenic effects in animals.

Unit-III: Geography of plant community, classification, origin, Evolution, Dispersal and distribution of plants. Major biomes of the world, Classification of soils, soil profiles, soil erosion, Degradation, world distribution of plants, causes and Adverse effects of deforestation and conservation measures, anthropogenic effects on plants.

Unit-IV: Marine Ecology: Meaning and concept and Factors of Marine Ecology, Adaptation of Phytoplankton's to marine environment, Trophic level and energy flow in marine ecosystem, Bio diversity :- Bio-Diversity- meaning, importance, and types of biodiversity, hotspots, causes of bio-diversity loss, conservation and management.

Reference

1. Bhattacharya N.N.(2005): Bio-Geography, Rajesh Publications, New Delhi.
2. Cox. C.D and Moore P.D (1993): Biogeography : An Ecological and Evolutionary Approach
3. Huggett R.J. (2004): Fundamentals of Biogeography, Routledge
4. Husain M. (1994): Biogeography, Anmol Publication, New Delhi.
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6. Mathur, H.S (1998): Essentials of Biogeography, Pointer Publishers, Jaipur
7. Pears Nigel (1985): Basic Biogeography, Longman, London, New York
8. Savindra Singh (2010): Biogeography, Prayag Pustak Bhavan, Allahabad.
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10. Simmons T.G (1974): Biogeography: Natural and Cultural, Arnold Heinmann, London
11. Tivy Joy(1992): BioGeography, A Study of Plants in the ecosphere, oliver and Boyd, Edinburg.

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SEMESTER – II
COURSE-IX: THEMATIC CARTOGRAPHY

LEARNING OUTCOME:

- Acquire professional skill to cater to the current trend where spatial knowledge is overwhelmingly preferred on maps and able to appreciate the Spatial visualization especially through complex and 3D maps.
- Create professionals who will qualify to produce significantly efficient spatial maps via different mapping programs and technologies such as geographic information systems (GIS).
- The professionals will get training on the basic skills which teach on the psychological perception, behavior, printing skills and psychological response of map user with different combination of colors, patterns and symbology on the map.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt the project, discussion and laboratory methods which helps the learners to acquire the fundamental aspects of map making skills.

COURSE CONTENT

Unit-I: **Nature of cartography**

a. Meaning of maps, Forms of representation,
c. Categories of maps: classed by scale, classed by function, classed by subject matter.
d. Impact of changing technology on cartography. Cartography as a science of human communication
e. Collection of data- Physical and cultural details.

Unit-II: Map Making Process

a) Scale, Reference and coordinate system ,Elements of generalization,
c) Measurement of geographical variables (nominal. Ordinal, interval, ratio,)
d) Thematic and complex mapping.

Unit III: Symbolization

a) Principles-Theory of Visual Perception, Symbolizing: qualitative, quantitative, continuous and discrete data; Perceptual considerations - i. Graphic elements ii. Visual variables iii. Classes of symbols
b) Mapping feature attributes using point, line and area ii. Point features - dot maps, iii. Line features - hatchures, profiles, oblique traces, isarithmic iv. Area features - choropleth mapping; dasymetric mapping v. Perspective features - Morphometric maps.

Unit-IV: Map design and Layout

a) Objective of Map design b) Elements of map design
c) Design principles: i) Legibility ii) Visual contrast iii) Figure – ground organization iv) Hierarchical organization;
d) Controls of map design (Purpose, Reality Available data Map scale Audience);
e) Computer cartography- hardware and software; Toponomy and map reproduction: planning and process related to duplicating; Printing and latest methods.

References

1. Misra R.P. and Ramesh.(1989) Fundamentals of Cartography, concept publishing Co. New Delhi.
2. Nag, P. ed., (1992) Cartography and Remote Sensing concept Publishing Co. New Delhi
3. Robinson, A H, Sale AH. Morrison JL and Muerake (1985) Elements of Cartography, John wiles and sons

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COURSE-X: GIS & REMOTE SENSING
(OPEN ELECTIVE)

LEARNING OUTCOME:

- To learn the basics of remote sensing and GIS.
- To apply the basic concepts and practice of the course for their interest.

PEDOGOGY:

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

COURSE CONTENT:

Unit – I: Introduction to remote sensing

1. Principles of remote sensing
2. Electro-magnetic radiation (EMR)
3. Electro magnet spectrum
4. Energy interactions with atmosphere
5. Energy interactions with earth-surface features.

Unit – II: Satellites and sensors

1. Microwave remote sensing
2. SAR and SLAR
3. Imaging interpretation and analysis

Unit – III: Introduction to GIS

Definition, concepts and components of GIS - Geographical entities

Unit –IV: Sources of spatial data

1. data encoding-spatial data modeling-raster-vector data models
2. Data management system: Relational and hierarchical modes
3. GIS applications.

Reference

1. Borrough P.A (1986), **"**Principles of Geographic information system for land resources,**"** Clarendon press, Oxford
2. Chrisman N.R. (1997),**"**Remote sensing and Geographical information systems**"**
3. Sabbins.F.F (1987), **"**Remote sensing: principles and interpretations**"**, W.H.Freeman and Co, New York
4. Haywood.L, Comelius.S and S. Carver (1988), **"**An introduction to Geographical information system**"**, Addistion Willey, New York.

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SEMESTER – II
COURSE-XI: GEOGRAPHY OF KARNATAKA
(OPEN ELECTIVE)

LEARNING OUTCOME:

- Understand the physical, economic and socio-demographic aspects of Karnataka state in a broader sense.
- Understand the resource base of the state I,e, forests, soils, minerals, water and climate, and its impact on the socio-demographic and economic development of different regions of Karnataka in terms of agriculture, industries, transportation and other fields of human activities.
- Understand the development of irrigational projects and industrial projects and special Economic zones (SEZ's).

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

COURSE CONTENT

Unit-I: Location , Administrative divisions and Physiographic divisions of the Karnataka. Geology, Rivers, Climate, Soils, vegetation, Social forestry and National Parks and Birds sanctuaries.

Unit-II: Development of Irrigation in Karnataka, Major Multipurpose river valley Projects, Krishna and Cauvery water dispute. Agriculture : Distribution of crops, Rice, Jowar, Ragi, Bajara, Maize, Wheat, Tur, Oil Seeds ,Sugarcane ,cotton, Tobacco, Coffee, Mango, Coconut, Areca nut, Pepper, Cardamom , Coriander and Sericulture.

Unit-III: Mineral resources: Distribution of Iron ore, Manganese, Bauxite, Copper, Gold. Major power Projects, Hydel power Projects, Thermal Power Plants and Atomic Energy centers. Industries: growth and Distribution of Cotton textile, Silk textile, Sugar, Iron and Steel, Cement and Paper Industries in Karnataka. Industrial Regions and Special Economic Zones in Karnataka.

Unit-IV: Transportation : Development and distribution of Roads, Railway, Water way Ports and Harbors and Airways. Population: growth Distribution, Density and Composition of Population in Karnataka. Tourism: major Historical and geographical Places in Karnataka.

Reference

1. R.P.Misra (1973): Geography of Mysore.
2. N.B.K.Reddy &G.S.Murthy(1967); Regional Geography of Mysore State.
3. P.Mallappa(2008): Geography of Karnataka.
4. Ranganath: Geography of Karnataka
5. Karnataka State Gazetteer.
6. Karnataka: Directorate of Information and Tourism, Govt, of Karnataka.

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THIRD SEMESTER

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UNIVERSITY OF MYSORE
Master of Science (M.Sc) in Geography
SEMESTER – III
COURSE-I: PRINCIPLES OF GIS

LEARNING OUTCOME:

- To learn the basics of GIS.
- To apply the basic concepts and practice of the course for their interest.

PEDOGOGY:

The concepts of GIS, components of GIS and application areas of GIS are comprehensively understood. Students will go beyond the conventional fundamentals in GIS and GPS and move forward into modelling and applications, including specialized GPS surveys for planning studies.

COURSE CONTENT:

Unit I: Introduction: Concepts, history and development of GIS, components of GIS, applications of GIS; Coordinate Systems –datum's, latitudes, longitudes, Geographical Coordinate Systems, WGS84, Projected Coordinate System and UTM; Geospatial data, data input-existing GIS data, creating new data; Query: Spatial and Non Spatial data query, Boolean algebra.

Unit II: Data Models and Management: Data format: Raster and Vector data formats; Spatial Data Models –Vector and Raster data models, Non- Spatial Data Models, Topology models, Grid model, TIN model, Network model, applications; Data collection, capture and Geo processing: Sources, input methods, editing, re-projection, geometric transformation, map scale, precision and accuracy.

Unit III: GIS Modelling and analysis: Basic elements of GIS modeling; Coupling-Loose, Tight coupling; Spatial interpolation: elements, sampling schemes, global-local methods, comparison of spatial interpolation methods; Vector data analysis: buffering, overlay; raster data analysis– local operations, neighborhood operations, zonal operations; terrain mapping and analysis- DEM and TIN, contour, hill shading, slope and aspect.

Unit IV: GNSS and RNSS: definition, history, components; types, working principles and application of GPS, GLONASS, GALILEO, COMPASS; system segmentation – control segment, user segment, space segment, types of receivers; GNSS: different GNSS, GNSS Augmentation; RNSS - IRNSS, WAAS, EGNOS, MSAS, QZSS, SNAS, SDCM and WAGE; advantages and disadvantages; Role of DGPS and RTK receivers for surveying applications.

References:

1. An Introduction to Geographical Information Systems - Ian Heywood
2. Geographic Information Systems: A Management Perspective - Aronoff, S.
3. GIS - Fundamentals, Applications and Implementations - Elangovan, K.
4. Introduction to Geographical Information Systems - Chang, Kang-Tsung
5. Remote Sensing and GIS - Bhatta, B.
6. Geographical Information Systems - Maguire, David J.

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UNIVERSITY OF MYSORE
Master of Science (M.Sc) in Geography
SEMESTER – III
COURSE-II: GEOSPATIAL ANALYSIS (PRACTICAL)

LEARNING OUTCOME:

- To learn the basics of GIS.
- To apply the basic concepts and practice of the course for their interest.

PEDOGOGY:

This is a practical course offering theme based, problem solving techniques of GIS methodology from data creation to advanced GIS and GPS analysis for student's analytical skill development.

COURSE CONTENT:

Unit I: Data capture and Management: Scanning of hardcopy maps, georeferencing and projection, data encoding, feature and geodatabase creation (point, line and area), digitization, topology, annotations; attribute data – joining, editing and integration, field calculation, spatial and non- spatial queries; symbolization and thematic mapping.

Unit II: Geo-processing and Modelling: Vector- raster manipulation and analysis; proximity analysis; Topographical modelling, 3D visualization and analysis; Sampling and Spatial Interpolation, accuracy assessment of interpolation techniques; Watershed analysis, Morphometric analysis, network analysis;

Unit III: Spatial Statistical Modeling: Identification of Central feature, directional distribution, mean center, median center, linear directional mean, standard distance, hot- spot analysis, correlation, raster calculator and Boolean operation. Exploring spatial relations using Ordinary least square (OLS), Geographical weighted regression (GWR),spatial autocorrelation;

Unit IV: GNSS/GPS Survey: Collection of Ground Control Points (GCP), precision, vertical and horizontal accuracy of collection; Waypoints, tracks, and transformation of GNSS/GPS data into GIS; Ground Truth Verification (GTV) of GPS data; Mobile based survey using Open data kit (form building, XML generation, data collection, andmapping)

References:

1. An Introduction to Geographical Information Systems – Ian Heywood
2. Spatial analysis and Location-Allocation Models - Ghosh, A. and G. Rushton
3. Geographic Information Systems and Cartographic Modelling - Tomlin, C.D.
4. Geographic Information Systems and Science - Paul A. Longley, et. al.
5. Geographic Information Systems and Environmental Modeling - Clarke, C., K.
6. Introduction to Geographic Information Systems - Tsung Chang Kang

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UNIVERSITY OF MYSORE
Master of Science (M.Sc) in Geography
SEMESTER – III
COURSE-III: ADVANCED SURVEYING (PRACTICAL)

LEARNING OUTCOME:

- Understand the basic principles of surveying such as the preparation of sketch, concepts of scales, common errors occur and field note taking and its importance etc.
- Learn the modern methods of surveying using the digital and satellite based GPS surveying.
- Be in a position to handle variety of survey instruments in different situations and able to prepare the map of the surveyed area, depicting the ground objects and other technical details on it.

PEDOGOGY

As this course is practical and lab oriented, it focuses on skill enhancement in addition to the conceptual base among the learners. Hence, the course shall adopt both observation method in the field and laboratory methods. Each learner shall be made to handle GPS software independently through hands on experience.

COURSE CONTENT

Unit- I. Basic Principles of surveying, definition , Classification of Surveys, Planning of Maps, Scales, Units of Measurements, Errors of surveying , Field Work, Booking Field Notes.

Unit- II: Modern Methods of Surveying, Application of Remote Sensing, Application of GIS, Application of Satellite-based Global Positioning System.

Unit- III: Earth linear measurement Theodolite and Total Station, Mapping the ground object, Locating the ground object from the map, Area computation-Triangle methods, Square method, Trapezium method, Ordinance method, Mechanical method, Measurement of vertical angle Theodolite and Total station.

Unit- IV: GPS Survey

i) Mapping the ground object
ii) Locating the ground objects from the maps

Reference

1. R. Subramanian, Surveying and Levelling , Oxford University Press
2. P.C. Punmia, Surveying, laxmi Publications, New Delhi-2005.
3. R.P. Mishra, Fundamental Catography, Concept publication, New Delhi, 2005.

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SEMESTER – III
COURSE-IV: TRANSPORTATION GEOGRAPHY

LEARNING OUTCOME:

- Able to know the spatial organization of different modes of transportation and understand the basic elements of transport network such as nodes, links, topology and measures of transport network.
- Able to appreciate the linkage between the places, functions and transport linkages over space.
- In a position to analyze the urban transport system and assess its problems and suggest solutions as a transport planner with the use of both theoretical as well as the technological background.
- Able to understand the transport policy with reference to India and sustainable transport planning.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

COURSE CONTENT

Unit-I: Historical evolution of transportation, Transportation and spatial organization; Modes of Transport, Basic elements of transport network-Nodes & links, Topology of Network, Measures of Transport Network.

Unit-II: Types of Movement and Causes of Movement, Spatial interaction and gravity model, spatial choices; destinations, modes & routes.

Unit-III: Urban transportation; urban land use and urban transportation, urban Road classification, urban mobility, urban transport problems and its planning, land use modeling, Impact of Telecommuting on Transportation.

Unit-IV: Transport planning & Policy: The nature of transport policies, the policy process, Transport policy in India ,Transport Planning, Geographic Information Systems in transport (GIS-T), Transport impact analysis and Sustainable Transportation

Reference

1. G.Gaile and C.Willmott (eds). **"**Transportation Geography**"** in Geography in American at the Dawn of the 21st century. New York. Oxford University press, 2004.
2. H.Dimitriou (ed) Transport planning for Third world cities. London. Routledge, 1990.
3. Jean – Paul, The geography of Transport system.
4. Saxena H.M (2005) **"**Transportation Geography**"**
5. William A Black-Transportation A Geographical Analysis. The Guilford Press, 2003
6. Bimal Dhawan-Transport Geography- Random Publications .2014
7. Moonis Raza (1999) Transportation Geography of India, Concept ublishing, company, New Delhi

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SEMESTER – III
COURSE-V: MONSOON CLIMATOLOGY

LEARNING OUTCOME:

- able to identify the significant characteristics of the Monsoon Climate
- able to differentiate between South West Monsoon and North East Monsoon regions
- in a position to Classify the climatic zones at micro and at regional level
- in a position to analyze the Global air circulation and its impact on Monsoon
- in a position to analyze the Sea Surface Temperature of Indian ocean Arabian Sea and Bay
- Candidate can work for various types of Land use and agriculture based planning institutes and companies

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted**.**

COURSE CONTENT

Unit-I: Introduction, Meaning of Monsoon, Areas of Monsoon Climate in the World, Summer Monsoon, Post Monsoon and Winter Monsoon, Nature of the Variability of the Indian Summer Monsoon. Atmospheric Rotating Systems, Convection and Rainfall in tropics, instability, Active and Weak Spells, Breaks in the Monsoon.

Unit-II: Basis of the Monsoon Climate, Tropical Convergence Zones(TCZs) and the Indian Monsoon. Variations in the convectional rainfall over the Oceans and land. Heat lows and Monsoon regions of the world.

Unit- III: Seasonal Transitions (onset and retreat) and Climate Clusters, Intra seasonal Variation and Intra seasonal Oscillation, Study of Tropical Oceans, EI Nino and Southern Oscillation. Indian Ocean and the Indian Monsoon.

Unit- IV: Inter annual Variation of the Indian Summer Monsoon, rainfall links to events over the Indian and Pacific Ocean, Monsoon Variability, Agriculture and Economy, Monsoon Prediction, Problems and Prospects.

Reference

1. Ramage C.S. : 1971: Mansoon Meteorology, Vol-15, San Diego.
2. Rao Y.P. : 1976 : South West Mansoon: IMD: New-Delhi.
3. Riehl H.: 1979: Climate and Weather in Tropic Academic Press, San Diego, New-York.
4. Chang C.P. and T.N. Krishnamurty (ed) 1987: Mansoon Meteorology, Oxford University Press.
5. Fein J.S. and P.L. Stephens (Ed): 1987: Mansoons: John Wiley: New-York.
6. Wang B. (Ed):2006: Asian Mansoon: Springer: Praxis.
7. Chang C.P.Y. Ding, N.C. Lau, R.H. Johnson, B.Wang and T. Yasunari: 2011: The Global Mansoon Sysetm World Scientific.

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SEMESTER – III
COURSE-VI: ENVIRONMENTAL GEOGRAPHY

LEARNING OUTCOME:

- Will have a knowledge and understanding of the dynamic nature of man- environment relation.
- Will able to understand the concept and different forms of ecosystem and their mutual relation in the form of energy flow, food chain and food web and food pyramid etc.
- Are able to realize the human ecological adaptation and the influence of human on environment both at global as well as regional scales with reference to different forms of pollution and environmental degradation.
- Are able to understand the need, methods and efforts at global and national level in order to mitigate the environmental degradation through various planning strategies for sustainable development.

PEDOGOGY:

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

COURSE CONTENT

Unit-I. Definition, Nature ,scope and importance, Environment Geography and Related sciences, Environmental Perception, Levels of Environmental perception and environmental society, Ecological Approaches, Man and Environment, Historical Perspective of ecological changes.

Unit-II. Concept of Ecosystem, structure, functioning and development of ecosystem, ecosystem productivity, trophic levels, Food chain and food web, food pyramid, energy flow in an ecosystem, energy loss in an Ecosystem, Major ecosystems, and historical development of ecology,, Influence of Man on Environment global and regional ecological changes.

Unit-III. Pollution and Environment Degradation, Meaning and concept- environmental degradation and pollution , sources, types, effects and measures of pollution in Air, Water, land, soil. Natural hazards and its impact on environment, Types of Environmental degradation, Processes , causes of Environmental degradation, population growth and environment, Agriculture development and Environmental degradation, deforestation and Environmental degradation, urbanization and Environmental degradation, industrial development and Environmental degradation.

Unit-IV. Environmental Planning and Management, Meaning, Importance, needs of EIA and Emerging Issues, UN processes and procedures for EIA, Global Environmental Issues, Environmental conservation, management and its approaches to environmental management, wild life Management, solid waste Management, Environmental Planning. concept of sustainable development Environmental education and legislation .

Reference

1. Dr. Alka Gautam(2013): Environmental Geography, Sharada Pustak Bhavan, Allahabad
2. Environmental Impact Assessment: A New Dimension in Decision Making, 2 Ed. „
3. H.M.Saxena (1999): " Environmental Geography", Rawat Publications, Jaipur.
4. Prof. P.R.Trivedi(2011): Environment Impact Assessment, APH Publication Corp. New Delhi
5. R.R.Barthwal(2002): Environment Impact Assessment, New Age International Publishers. Bangalore.
6. Savindra Singh: Environmental Geography, Prayag Pustak Bhawan, Allahabad.

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SEMESTER – III
COURSE-VII: POPULATION RESOURCES AND DEVELOPMENT

LEARNING OUTCOME:

- Understand different problems of population on environment and ecology.
- Be able to learn about population resource nexus and carrying capacity
- Be able to understand the relationship of population with economy in terms of development.
- Be able to analyses the main problems behind some emerging demographic issues like Ageing, demographic dividend etc.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted**.**

COURSE CONTENT

Unit-I: Population Resource Nexus, limits to growth, optimum, over and under population. Population equalibilium, Concept of carrying capacity of the earth. Population pressure. Impact of population pressure on energy, water and other resources. Population and food security / supply. Hunger, health and malnutrition. Population – resource regions of the world.

Unit-II: Population growth and its environmental implications. Direct and indirect impact on environment. Impact on lithosphere, Atmosphere, Hydrosphere, Biosphere. Other implications.

Unit-III: Population and development relationship. Concept, content and measure of development. Human development Index and its spatial analysis. Population and development - Experiences of the western countries and third world countries. Impact of population on economic development with reference to India. Quality v/s quantity of population.

Unit-IV: Emerging demographic issues, Demographic dividend, Ageing process, Gender issues, Quality of life, Demographic regions.

References

1. Lester R. Brown (1976) – In the Human Interest, A Strategy to stabilize world population, affiliated east– West Press, New Delhi.
2. B.N. Ghosh (1998) – Population Theories and Demographic Analysis, Meenakshi Prkashan, Meerat.
3. H.M. Saxena (1999) – Environmental Geography, Rawat Publication, Jaipur.
4. Nauhminal Singh (2002) – Population and Poverty, Mittal Publication, New Delhi.
5. Liebid and Iruday Rajan (2005) – An Ageing in India: Perspective, Prospects and Policies, Rawat Publication, Jaipur.

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COURSE-VIII: URBAN GEOGRAPHY

LEARNING OUTCOME:

- able to understand the concept and process of urbanization.
- Familiar with the aspects of urban structure, linkages between urban and rural settlements.
- Able to understand contemporary urban issues such as migration, slums, squatter settlements, environmental quality, urban land value and urban transport.
- also understand needs and methods of urban planning and urban development programs in Indian context.

.**PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted**.**

COURSE CONTENT

Unit-I. Urbanization Concepts and process: meaning of urban settlements and Urbanization. Criteria used to distinguish urban settlements, Behavioral structural and demographic concept of Urbanization, distribution and evolution of cities through historical times, Urbanization curve.

Unit-II. Urban Morphology- Models of Urban structure: Park and Burgess Model.Homer And Hoyt model, Harris and Ullman model. Rural- Urban fringe: Meaning, characteristics, Suburbanization, Concepts of conurbation, megalopolis, Satellite towns. Factorial ecology and social area analysis.

Unit-III. City and its region, Contemporary Urban issues: Concepts of city region, Characteristics and demarcation, Nature of Urban influence. Contemporary Urban issues: Price of land and vertical and horizontal growth of cities, Urban sprawl, Scarcity of housing and growth of slums, problems of civic amenities, urban transport problem, Environmental pollution.

Unit-IV. Urban policy and planning with special reference to India: Policies of Urban development: Smart cities, AMRUT,(Atal Mission for Rejuvenation and Urban Transformation) PMAY (Pradhan Mantri Awaz yojana) DAY (Deen Dayal Antyodaya Yojana) RAY (Rajiv Gandhi Awaz Yojna) JNNURM (Jawaharlal Nehru National Urban Renewal Mission) SBM-U (Swatch Bhart Mission – Urban) Urban regeneration, City Planning; Need and elements of city planning, Master plans of towns. The concept of sustainable cities and Sustainable Urban growth.

References

1. Roberts, Brian K. (1996): Landscapes of settlement: Prehistory to the Present, Routledge, London.
2. Gates, Richard and stout, Fredric (2000): The city Reader, Rout ledge (London and New York)
3. **O"sullivan, A**. (2000): Urban Economies, 4th Edition, Me Graw Hill, Boston
4. Knox, Paul and Pinch Steven (1996): Urban Social Geography: An Introduction
5. Carter (1972): The study of urban geography, Edward Arnold, London.
6. Kundu.A (1992): Urban development and urban research in India, Khanna Publications
7. Hall P (1992): Urban and regional planning, Rout ledge, London
8. Tim Hall: Urban Geography
9. K Siddhartha and S Mukherji: Cities, Urbanizations and urban systems.
10. Shah Manzoor Alam: Urbanization in developing countries.

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SEMESTER – III

COURSE-IX: MONSOON CLIMATE AND FLUVIAL GEOMORPHOLOGY

LEARNING OUTCOME:

- get to know the relevance of climate, Rivers and its action over land.
- come to know how the river reacts to the internal disturbances of the earth
- understand the relationship between the different drainage pattern and geology.
- understand the inter relationship between the different stream orders and the cropping pattern

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted**.**

COURSE CONTENT

Unit-I.: Monsoon Climate and Fluvial Geomorphology; Characteristics of Indian Monsoon-Mechanism of Indian Monsoon; Impact of Monsoon on Fluvial Geomorphology in India; Comparative Study of Various types of Geomorphological Landforms of India; Glaciated Topography of Himalayan region-Drainage Pattern, Stream Orders, Density, Relief and Gradient; Fluvial Landforms of Indo Gangetic Plains-Drainage Pattern ,Stream Orders, Density, Relief and Gradient; Arid Geomorphology of Thar Region; Fluvial Geomorphology of undulating landforms of Peninsular Region; Drainage Pattern, Stream Orders, Density, Relief and Gradient; Geomorphology of Coastal Region-Drainage Pattern, Stream Orders, Density, Relief and Gradient; Erosional feature of River: Geological Braided Streams; Depositional features of river: Depositional Braided Stream; Fluvial Cycle of Erosion and soil formation Development of Slope and Types of slope

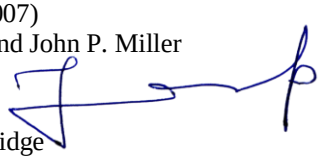
Unit-II.: Hydrogeology of a fluvial system River Basin; Watershed, Drainage Pattern, Valley profile, Stream Orders and Its Significance, Stream Density and its importance, Water Holes, Perennial lakes, Non Perennial lakes, Vanishing lakes. Check dams, Points of Ground water recharging

Unit-III.: Fluvial Morphometric; Significance of morphometric and its applications, Elements of Morphometric, Linear Aspects: Stream ordering, bifurcation ratio, law of stream numbers, length ratio, law of stream length, Sinuosity indices, Stream junction angles, Areal Aspects: Geometric of basin shape, law of basin perimeter, basin length and basin area, area ratio, law of basin area, law of allometric growth, stream frequency, drainage density, drainage texture; Relief Aspects: Hypsometric analysis, clinographic analysis, altimetry analysis, average slope, relative relief, dissection index, law of channel slope, Profile analysis.

Unit- IV: Structural Deformations and Fluvial Responses with special reference to Cauvery Basin Tectonic and Fluvial Geomorphology 2 Geological Structure controlled channel Paths: Narrow streams, Gorges Canyons, wide streams, Marshy and Swampy Landform. Non Geological Controlled Channel Paths Meandering streams Inter-locking spurs. Causes for the formation River capture, River meanders, Waterfalls, Gorges, Meandering loops,

Reference

1. Fundamentals of Fluvial Geomorphology by Charlton Ro (Paperback - Dec 26, 2007)
2. Fluvial Processes in Geomorphology by Luna B. Leopold, M. Gordon Wolman, and John P. Miller
3. Tools in Fluvial Geomorphology by G. Mathias Kondolf and Hervé Piégay
4. Fluvial Forms and Processes: A New Perspective by David Knighton
5. Rivers and Floodplains: Forms, Processes, and Sedimentary Record by John S. Bridge



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COURSE-X: HUMAN GEOGRAPHY

(OPEN ELECTIVE)

LEARNING OUTCOME:

- understand the concepts, contributions of different schools and traditions of human geography.
- critically think the impact of physical forces on the distribution and diffusion of cultural elements like language, religion, race and tribes.
- understand the spatial pattern of natural resource base and human development, global and regional population growth and distribution and demographic characteristics.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted**.**

COURSE CONTENT

Unit-I: Field and Scope of Human Geography. Branches of Human Geography. Approaches - Nomothetic and Idiographic. Development of Human Geography – Germans, French and American contribution.

Unit-II: Cultural Diversities – Race, Religion and Language. Major tribes of the World.

Unit-III: Survey of World Resources – Concept and Types of Resources. Forest resources, Mineral and Power resources – Iran, Manganese, Bauxite, Gold, Coal, Petroleum, Atomic and Hydro. Agricultural region of the World.

Unit-IV: Population of the World – Density and Distribution, Growth and Composition. Human Migration – types, Causes and Consequences.

References

1. Majid Husain (2002) -Human Geography, Rawat Publication, Jaipur.
2. Rubenstein and Baoon (1990)- The cultural Landscape: An Introduction to Human Geography, Prentice – Hall of India Ltd., New Delhi.
3. Brek and Webb (1968) – A Geography of Mankind, McGraw – Hill Book Company, New York.
4. Peter Hagget (1972) – Geography: A modern Synthesis, Harper & Row Publishers, New York.

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COURSE-XI: PHYSICAL GEOGRAPHY
(OPEN ELECTIVE)

LEARNING OUTCOME:

- get clarity about the natural laws and its function and its applications
- come to know the various forms of denudational agents and its role in forming new landforms
- be in a position to evaluate the nature of land and its origin
- be in a position to undertake research to understand the local function
- be in a position to classify the natural regions and its positive and negative characteristics

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

COURSE CONTENT

Unit –I: Solar system – shape & size of the earth, Movement of the earth- Rotation & Revolution Effects of the movement – Earth coordinates – Latitude Longitude & Time.

Unit – II: Composition of the Earth's Interior, Rocks, –Minerals – Classification and rocks – Igneous rocks sedimentary rocks, Metamorphic rocks, Weathering – Mechanical, Chemical and Biological Work of Running Water and Glaciers.

Unit – III: Composition of Atmosphere, Weather and Climate Factors affecting the Distribution of Temperature, Insulation, Horizontal and Vertical Distribution of Temperature-seasonal variation in the general distribution of Temperature pressure and winds, Rainfall – Types of rainfall.

Unit – IV: Distribution of Land & Sea – submarine relief, surface relief of the ocean vertical distribution of Temperature, Salinity – Factors controlling Salinity, Distribution of the salinity, ocean currents, tides & Types of tides.

Reference

1) B.S.Negi (1993) "Physical Geography" S.J Publication. Meerat.
2) R.N.Tikka (2002)"Physical Geography" Kedar nath ram nath & co. Meerat.
3) K.Siddhartha (2001) "Atmosphere, wheather and climate", Kisalaya publication, New Delhi.
4) William D. Thornbury (1997) "Principle of Geomorphology", New Age International (P) Limited, New Delhi.
5) D.S Lal (1998). "climatology" Chaitanya publishing house, Allahabad.

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FOURTH SEMESTER

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UNIVERSITY OF MYSORE
Master of Science (M.Sc) in Geography
SEMESTER – IV
COURSE-I: ECONOMIC GEOGRAPHY

LEARNING OUTCOME:

- Understand the basic aspects of spatial structure of economy and human interaction
- Understand the process of decision making in economy where they are going to know how the time and space effects on decision making.
- Understand the theories and model relating to the location of industries considering various aspects of location such as transport cost, resources cost, land rent and labour cost etc.
- Understand the consumer behavior, spatial variation in consumer consumption and location, origin and characteristics of market centers and also know movement of commodities, people and information.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted**.**

COURSE CONTENT

Unit I: Meaning, nature, scope and importance of Economic Geography. Simple model of the Economy, spatial structure of the Economy, Environmental relations of the economy. The Economy and Economic Geography, spatial and systematic Approaches.

Unit II: Decisions making in the economy: Types and mechanics of decision making, Effect of time and space on price formation, government intervention in price mechanism. Firms, functions of firms, decision making and the process of production, choice of output choice of technique.

Unit-III: Theories of Industrial location:- Factors of industrial Location Geographical , Social , Economic, Environment , historical and political, types of industries, Resource based and foot loose industries. Industrial growth and its impact on environment and remedial measures, problem and prospects of industrialization. Theories of industrial location:- Least cost school, Transport cost school, market area school, marginal location school, and Behavioral school.

Unit-IV: Consumer**'**s behavior and the economy- Analysis of consumer**'**s behavior, spatial variation in consumption, consumer behavior in space. Market centres- origin and types periodic and daily markets, sequential development. Movement, the generation of movement between areas, spatial and non-spatial factors. The Distribution of Movement.

Reference

1. David M.Smith(1984) – Human Geography, A Welfare approach, Arnold Heinemenn, London
2. Dr.Alka Gautham(2013) – Advance Economic Geography, Sharada Pustak Bhavan, Alahabad
3. Hodder and Lee (1982) – Economic Geograpy, Methuen and Co, London
4. John W.Alexander and Gibson (1979) – Economic Geography, Prentice – Hall of India Private Limited, New Delhi.
5. K.Siddhartha (2000) – Economic Geography, Kisalaya Publications, New Delhi.
6. Prithwish Roy(2005) – Economic Geography, New Central Book Agency, Kolkatta.
7. Smith (1978) Industrial Location, Prentice Hall, Englewood Cliffs, N.J.
8. Truman A. Hartshorn and John W.Alexander – Economic Geography

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SEMESTER – IV
COURSE-II: MULTIVARIATE STATISTICS

LEARNING OUTCOMES:

- get to know about the use of basic statistical measures and its use in Geography.
- be able to understand different central tendency measures like Mean, Median, Correlation Coefficient, Regression and its application in Geography.
- be familiarised with different data collection methods with the help of different types of sampling and its limitations.
- Know the use of SPSS software and its use in Geography for analysing geographical data.

PEDOGOGY:

As this course is practical and lab oriented, it focuses on skill enhancement in addition to the conceptual base among the learners. Hence, the course shall adopt observation method through field studies and laboratory methods shall be adopted.

COURSE CONTENT:

Unit-I. Significance of Statistics in Geography, Review of basic statistical measures.Measures of Central tendencies, Measures of variation, Analysis of Variance (ANOVA),

Unit-II. Basic Multi Variate Analysis. Correlation Analysis - Correlation coefficient for grouped and Uni grouped data, Rank Correlation. Regression Analysis – Simple Linear regression, Residual Analysis, Multiple Regression.

Unit-III. Theory of Sampling and Testing of Hypotheses: Types of Sampling, Sampling distribution and standard error. Testing of Hypotheses – t test, f test and Chi-square Test.

Unit-IV. Advanced Multivariate Analysis: Introduction, Factor Analysis and its methods, Centroid method, Principal Component Method, Use of SPSS in Statistical Analysis.

References

1. R.Pannerselvam- Research methodology, Prentice hall India, New Delhi, 2008.
2. C.K Kothari - Research methodology, New Age International publishers, New Delhi, 2007.
3. Aslam Mohammad – Statistical methods in Geographical Studies. Rajesh Publishers,
4. RSN Pillai and Bhagavathi – Statistics –Theory and Practice, S Chand and Co.Ltd. New Delhi. 2007.

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SEMESTER – IV
COURSE-III: METHODS OF REGIONAL ANALYSIS

LEARNING OUTCOMES:

- Will be familiar with the basic concepts of Region and regionalism
- Will understand the theories and models on regional growth and spatial diffusion
- Will be able to understand the concepts like growth pole and growth centre and modifications which are very critical aspects in regional analysis.
- Are able to understand the concept and factors of disparity in regional growth and development are able to measure level and extent of regional development to understand the disparity.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

COURSE CONTENT

Unit-I. Regional concept and regional methods. Types of regions characteristics of different regions. Delineation of regions and methods of delineation. Regionalism v/s Sectionalism. Regional consciousness and contemporary regional movements in India- Telangana, Gorkaland, Kodagu etc.

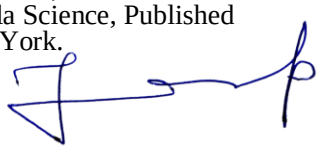
Unit-II. Analysis of regional growth and diffusion. Sector and Stage theory of Regional growth, Export base theory of Douglesic, North, economic base theory, convergence and divergence growth, multi plier effect. Analysis of spatial diffusion at local and regional level. Simulation analysis.

Unit-III. Growth pole and growth centers in regional analysis. Growth pole theory perrolux, Mydral, Hermensons views. Limitations of the growth pole, modifications - R.P.Mishra**'s** growth foci. growth poles and regional development. Input and output analysis in general and regional context.

Unit-IV. Analysis of Regional disparities **–** Balanced and unbalanced growth, Williamson's views on region inequality, causes for disparities in regional growth causes and consequences. Measures of disparities. Extent of disparities in India and Karnataka.

References

1. Abler, Adams and Gould (1971) – Spatial Organization, Prentice – Hall, Englewood Cliffs, New Jersy
2. R.P. Mishra (1992) – Regional Planning, Concept Publishing Company, New Delhi.
3. Jayasri Ray Chaudhuri – An Introduction to Development and Regional Planning, Orient Longman LtD, Kolkata.
4. John Glasson (1975) – An Introduction to Regional Planning, Hutchinson Prakashan, Meerat.
5. Walter Isard (1960) – Methods of Regional Analysis: an introduction to Regionla Science, Published by, The Massachusetts institute of Technology & John Wiley & sons, Inc, New York.



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SEMESTER – IV
COURSE-IV: DISASTER MANAGEMENT

LEARNING OUTCOMES:

- will able to create awareness about different forms of disaster its and impact and consequences.
- will know which are the striking variable to be considered to extract the Susceptibility zones
- will able to identify the Susceptibility areas and zone such as Flood, Forest Fire, Cyclone, Landslide and Earthquake mapping,
- will be in a position to Manage a Disaster event successfully

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted**.**

COURSE CONTENT

Unit –I. Disasters: Definition and Concepts: Hazards, Disasters; Risk and Vulnerability; Classification

Unit- II . Types of Environmental hazards & Disasters: Natural hazards and Disasters, Man induced hazards & Disaster-Earthquake, Tsunami, Landslides, Cyclones, Floods, Drought, Desertification Distribution and Mapping

Unit – III: Manmade disasters: Causes, Impact, Distribution and Mapping, Response and Mitigation to Disasters: Mitigation and Preparedness, NDMA and NIDM; Indigenous Knowledge and CommUnity-Based Disaster Management; Do‟s and Don‟ts During and Post Disasters

Unit-IV. Harnessing Information and Technology: Application of GIS.GPS and Remote Sensing in Disaster Management.

References

1. R.B. Singh(Ed) Environmental Geography, Heritage Publishers New Delhi,1990
2. Savinder Singh Environmental Geography, Prayag Pustak Bhawan,1997
3. Kates,B.I & White. G.F. The Enviornment as Hazards, Oxford, New York, 1978
4. R.B.Singh(Ed) Disaster Management, Rawat Publication, New Delhi, 2000.
5. H.K.Gupta(Ed) Disaster Management, University Press, India, 2003.
6. A.S.Arya Action Plan for Earthquake, Disaster, Mitigation in V.K.Sharma(Ed)
7. Disaster Management IIPA Publication New Delhi, 1994
8. R.K.Bhandani An overview on Natural & Man made Disaster & their Reduction, CSIR, New Delhi.
9. M.C.Gupta Manuals on Natural Disaster Management in India, National Centre for Disastr Management, IIPA, New Delhi,2001
10. Global Environment Out look (2002) UNEP Earth Scan Publications Ltd, London.

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Master of Science (M.Sc) in Geography
SEMESTER – IV
COURSE-V: REGIONAL DEVELOPMENT IN INDIA

LEARNING OUTCOMES:

- Know about different types of approaches in planning in India to shape our nation.
- Know about tribal, drought prone area development as well as metropolitan area development.
- Will know about different poverty allevation programmes launched in India like NAREGA.
- learn about different case studies of different regions like bastar, DVC, terai region etc.

PEDOGOGY:

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

COURSE CONTENT

Unit-I. Planning – types, need for regional approach in planning- regional planning – nature and principles Top-down and bottom up strategies in planning. Multi – level planning, Block and district level planning. Approaches to Regional Planning, Total regional approach, selective regional approach and target group approach. Social and environmental issues in planning.

Unit-II. Regional development policies and programmes in Indian five year plans – Regionalization process in India, A review. Backward area development programmes. Tribal area development programmes, Drought prone area development programmes, Hilly area development programmes, Command area development programmes, Metropolitan area development programmes.

Unit-III. Rural development in India process and objectives – major rural development programmes in India- pre-independence efforts. A brief study of various rural development programmes during different five year plans up to NAREGA. Urban development programmes in India – A review.

Unit-IV. Case study of regional development programmes in India. NCR region, Tungabadra command area, Terai region, Baster region, Dandakaranya Region, Damodar Valley region.

References

1. Hemalata Rao (1984) – Regional Disparities and Developmant in India, Ashish Publishing House, New Delhi.
2. Mahesh Chan and Puri (1997) – Regional Planning in India, Allied Publishers limited, New Delhi.
3. Mahapatra and Routray (1998) Regional Development and Planning, Rawat Publications, Jaipur.
4. Sudhanshu Shekar (2004) – Regional Planning in India,Anmol Publication, New Delhi.
5. T.N.A. Rao (1993) – Regional Development – Levels of Development of Karnataka, Printed by impressions, Belgaum.

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SEMESTER – IV
COURSE-VI: MEDICAL GEOGRAPHY

LEARNING OUTCOMES:

- Able to understand the growth and importance of the medical geography as a sub branch in human geography.
- They can critically think the dynamic human-environment interaction and human health outcome, social environment and health, population dynamics and epidemiological transitions and changing disease risk factors.
- They will understand the factors responsible in the global health care inequality and introduced to health policies and programmes in different development blocks in the world.

PEDOGOGY:

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

COURSE CONTENT

Unit-I. Concepts and Traditions: Definition, scope, elements, Growth of medical Geography Methods and techniques.

Unit-II. Human-Environment Interaction: Health and environment-concept of health, Geographical approaches of health, Natural environment and health- Inorganic and organic, Social environment and health : Food intake, Perception of diseases, Treatment of diseases, Socio-economic conditions and health.

Unit-III. Modernization, Population change and health: Disease classification- Genetic, Communicable, communicable, Occupational, deficiency diseases, WHO Classification of diseases. Diseases Diffusion: non-Meaning, factors/barriers, Phases, Types of diffusion. Epidemiological Transition-The theory of epidemiological transition (Omran theory) factors of transition- Demographic, Changes in risk factors, Practices of modern medicine. Indicators.

Unit-IV. Global Inequalities in Health care: Concept of health care, levels of health care, health care accessibility and utilization, Health care delivery system worldwide, health care services in India, health care policy in India.

Reference

1. Husain Majid (1994): „Medical Geography", Amol Publication Pvt.Ltd. New Delhi
2. Learmonth A T A (1978): „Patterns of diseases and hunger", a case study in Medical Geography,David and Charles, Victoria
3. May J M (1970): „The world atlas of diseases" National Book Trust, New Delhi
4. Mc. Glashan N.D (1972): „Medical Geography, Methuen, London
5. Misra R P (1970): „Medical Geography" National Book Trust, New Delhi
6. Rais A S Learmonth A T A (1990): „Geographical aspects of health and diseases in India" rawat Publication, Jaipur
7. Stamp L. D.(1964): „Some aspects of Medical geography", Oxford University Press Oxford
8. M.S.Meade and R.J. Erickson (2005), Medical Geography Guilford press.

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SEMESTER – IV
COURSE-VII: APPLIED CLIMATOLOGY

LEARNING OUTCOMES:

- Know various methods and techniques of weather data acquisition, processing, analysis and forecasting at different scales.
- Be aware of its application in different fields of human activities.
- Critically understand the natural and human factors influence on climate change and its impact at local and global scale in different dimensions.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted**.**

COURSE CONTENT

Unit- I: Nature and Scope, History, Development and Importance of Applied Climatology, Weather Analysis: Data Acquisition and Dissemination, Weather Instruments: Use and Functions.

Unit- II: Weather Forecasting Methods, Types and Accuracy, Medium Range and Long Range Forecasts, Role of Satellites in Weather Analysis and Forecasting; Relationships between Climate and Ocean; El-Nino, La-Nino effects.

Unit- III: Climate Change: Meaning, causes: Natural- Plate Tectonics, Volcanic Activity, Orbital Variations, Solar Variability, Global Warming, Ozone Depletion, Anthropologic causes, Impact: economic and social impacts..

Unit- IV: Vulnerability and Disaster mitigation: Risk, Vulnerability, Adaptation and Mitigation measures to climate change. Application of Geospatial technology in climate studies and research.

References

1. Thompson Russel D: 1997: Applied Climatology, John Wiley, New York.
2. Berry and Perry: Synoptic Climatology.
3. Mather J.R.: 1974: Climatology Fundamentals and Applications.
4. Stinger: Techniques in Climatology.
5. Lal D.S.: 2014: Climatology.
6. Trewartha G.T.: An Introduction to Climate
7. Davis R.J.A: 1986: Oceanography; An Introduction to Marine Environments, Winc-Brown Publication, Iowa
8. Patterson: Introduction to Meteorology.
9. Critchfield H.J.: 1975: General Climatology, Prentice Hall, New-Jersey.

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Master of Science (M.Sc) in Geography

SEMESTER – IV

COURSE-VIII: APPLIED GEOMORPHOLOGY AND RIVER BASIN PLANNING

Learning outcome:

- Perform how to map the earthquake susceptibility zone
- will perfom how to identify the ground water potential zone
- will able to perform the crop suitability analysis
- able to perform flood zone mapping
- able to create Urban Land use Planning based on Geomorpholigical Principles

PEDOGOGY

As this course is practical and lab oriented, it focuses on skill enhancement in addition to the conceptual base among the learners. Hence, the course shall adopt laboratory methods.

COURSE CONTENT

Unit-I. Interrelationship of Geomorphology with Climate and Geology: Sources of Geomorphological Data: Topographical Maps, AerialPhotos, Satellite Images. Geomorphological signatures and deriving inferences on Relief, slope, Climate: temperature and rainfall, Geology, Ground Water Level, Level of Agriculture.

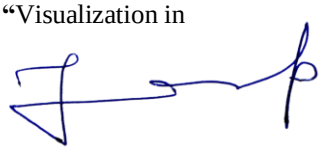
Unit-II. Groundwater Resources and Water Management: Concept of River Basin, Watershed and sub watersheds. Demarcation of Watershed and its importance; Significance of Stream Orders and stream Density in the assessment of Ground water scenario. Geomorphic factors determining the Identification of Sites of Check Dams and Groundwater recharge Points; Surface Water resources conservation and Management (Lakes, Tanks, Pools, and Stream Path).

Unit-III. Introduction Agriculture Land Use Planning : Categorization of agriculture zones based on geomorphic aspects. Land use and Agriculture planning in Undulating Topography, Mountain area, Piedmont Regions, Flood Plains Mid Valley Topography.Flood disaster Management and Planning. Pre Flood Disaster Onsite and offsite research inventories.Parameters determining the flood zone. Identification of high Moderate and Low flood risk zones, Methods of Proposing appropriate and feasible Measures to check flood at micro level.

Unit-IV. Urban lanning-Significance of Urban Land use planning based on Geomorphological Landforms. Examining the Compatibility of Different Urban Land Use Model with Geomorphological Landforms.:

References

1. Singh R.L.: Elements of practical Geography, Kalyani Publications (2005).
2. Misra R.P. : Fundamentals of Cartography, Concept Publication, New Delhi (2001)
3. Hammond R and Mecullagh P : Quantitative techniques in Geography, Claredon Press, Oxford (1975).
4. Anson R.W and Colour use guidelines for mapping and Visualization "Visualization in Modern Geography", Oxford.



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SEMESTER – IV
COURSE-IX: DISSERTATION

LEARNING OUTCOME:

- Able to Handle research projects independently and confidently.
- able use different and appropriate analytical tools as per the topic and methodology
- in a position to generate Maps Charts and data Tables
- in a position to interpret the data and draw inferences and conclusions.

PEDOGOGY:

As this course is mandatory the learners are encouraged to take up observation through field studies and use of both conceptual and practical knowledge acquired during the earlier courses. The methods and techniques are case specific but it is expected to make use of practical and lab which shall be able to reveal the level of skill elopement and ability to apply them in different situations in addition to the conceptual understanding. Hence, the course shall adopt observation method through field studies and laboratory methods shall be adopted.

COURSE CONTENT

M.Sc Geography Programme Students are assigned to take up dissertation work of local and regional relevance to make them exposed to real situation and come out with appropriate strategies using both theoretical and practical skills.

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Master of Science (M.Sc) in Geography
SEMESTER – IV
COURSE-X: GEOGRAPHY OF INDIA
(OPEN ELECTIVE)

LEARNING OUTCOME:

- As this course is prescribed for non-geography students, the students of other disciplines opt this course.
- Able to understand the physical background such as the geographical position, size, physical characteristics and boundaries of India.
- Will be familiar with the climate and factors influencing on it and they are able to know the resource base of the country like forest, soil, water, minerals etc.
- Able to establish the relation between the Industrial concentration, its development, Transport development and locational aspects with the natural resources base in the country.

PEDOGOGY

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

COURSE CONTENT

Unit-I. Geographical location of India, Economic Position of India in relation to world, salient features of geological structures of India. Main Physiographic divisions: Northern Mountains, North Indian Plains, Peninsular Plateau ,Costal lowlands and islands, Drainage system of India, East flowing and West flowing rivers.

Unit-II. Climate seasons and Climatic Regions: various seasons and associated weather conditions, mechanism of Monsoon, majors climatic regions of the India. Soils, types and their distribution , soil degradation and conservation. Forest, types and their distribution in India, deforestation and conservation of forest.

Unit-III. Minerals and Power Resources ,distribution of Ironore, Manganese, Bauxite ,coal ,Petroleum and Natural gas , Major power projects in India(Hydro, Thermal, Atomic) Agriculture, Distribution of Major Crops, Rice, Wheat, Cotton, Sugarcane, and Maize. Green revolution in India.

Unit-IV. Major Industries and Industrial development in India. Distribution of Industries, Cotton textile, Iron and Steel Sugar, Chemical fertilizers and engineering . Industrial Regions of the India. Transportation: Road, Railway, Airway and Inland Water transportation systems in India. Population growth , distribution and composition in India.

Reference

1. Chopra S.N : India an area study.
2. Dubey and Negi: Economic Geography of India.
3. Gopal Singh: Geography of India.
4. Khulhar: Regional geography of India.
5. Singh R.L: Regional geography of India.
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