FOUR YEARS UNDER GRADUATE (FYUG) PROGRAMME
UNDER
NEW EDUCATION POLICY, 2020

GEOGRAPHY

Date of approval in Academic Council – 30th May and 21st June 2024

Preface

The syllabus for Geography at undergraduate level using the Choice Based Credit system has been framed in compliance with model syllabus given by UGC in compliance with the NEP 2020. The broad objective of this syllabus is to enable the students acquire a holistic understanding of the subject matter with emphasis on diverse approaches adopted by geographical sciences in dealing with spatial phenomena concerning both physical and human dimension in their interactive interface. Care has been taken to provide the students with a judicious mix of courses dealing with theories, techniques, and modern technologies in dealing with spatial interaction and research preparedness with an overall aim of inculcating spirit of critical thinking and improving employability through skill development in emerging areas of digital cartography, GIS and quantitative techniques in tune with the changing nature of the subject. Attempts have been made to equip the students with the ability to comprehend both analytical (spatial) as well as synthetic (regional) dimension of geographical knowledge through courses designed to focus on practical applicability of the acquired knowledge in diverse fields of the subject.

Programme outcome (PO)

As an outcome of the syllabus it is expected that the students will be able to advance their level of understanding of geography as a holistic subject with acquired competence and expertise dealing with space and spatial issues and find solutions to the problems that concern global inequality, climate change, environmental degradation, pollution, hazards and disasters, biodiversity loss, urbanisation, crowding, social and ethnic conflicts etc. at different levels of spatial hierarchy- from global to local.

Structure of the Syllabus

1st Semester

Course Code	Title of the Course	Credits			Total Contact Hours
		Theory	Practical	Total	
GEO-100	Introduction to Human Geography (Major)	4	-	4	60
GEO-100	Introduction to Human Geography (Minor)	4	-	4	60
MDC- 110. ... 119	Any of the available course as notified by the University from time to time.	3	-	3	45
AEC- 120….129	Any of the available course as notified by the University from time to time.	3	-	3	45
SEC-130….. 139	Any of the available course as notified by the University from time to time.			3	45 - 90
VAC-140	Environmental Science	3	-	3	45
				20	

2nd Semester

Course Code	Title of the Course	Credits			Total Contact Hours
		Theory	Practical	Total	
GEO-150	Introduction to Physical Geography (Major)	4	-	4	60
GEO-150	Introduction to Physical Geography (Minor)	4	-	4	60
MDC-160…..169	Any of the available course as notified by the University from time to time.	3	-	3	45
AEC- 170…..179	Any of the available course as notified by the University from time to time.	3	-	3	45
SEC-180……189	Any of the available course as notified by the University from time to time.			3	45 - 90
VAC-190….. 199	Any of the available course as notified by the University from time to time.	3	-	3	45
				20	

3rd Semester

Course Code	Title of the Course	Credits			Total Contact Hours
		Theory	Practical	Total	
GEO-200	Regional Geography of India (Major)	4	-	4	60
GEO-201	Historical Development of Geography (Major)	4	-	4	60
MDC-210…..219	Any of the available course as notified by the University from time to time.	3		3	45
AEC-220…..229	Any of the available course as notified by the University from time to time.	2		2	30
SEC-230……239	Any of the available course as notified by the University from time to time.			3	45 - 90
VTC - 240…..249	Any of the available course as notified by the University from time to time.	1	3	4	105
				20	

4th Semester

Course Code	Title of the Course	Credits			Total Contact Hours
		Theory	Practical	Total	
GEO-250	Settlement Geography (Major)	4	-	4	60
GEO-251	Fundamentals of Economic Geography (Major)	4	-	4	60
GEO-252	Statistical Techniques in Geography (Major)	-	4	4	120
GEO-253	Thematic Cartography and Survey Techniques I (Major)	-	4	4	120
VTC-260….269	Any of the available course as notified by the University from time to time	1	3	4	105
				20	

5th Semester

Course Code	Title of the Course	Credits			Total Contact Hours
		Theory	Practical	Total	
GEO-300	Thematic Cartography and Survey Techniques II (Major)	-	4	4	120
GEO-301	Population Geography (Major)	4		4	60
GEO-302	Introduction to Remote Sensing and GIS (Major)	-	4	4	120
GEO-302	Geography and Environment (Minor)	4	-	4	60
GEO-303	Internship/Apprenticeship/Community engagement and service/ field based learning or minor project	-	4	4	120
				20	

6th Semester

Course Code	Title of the Course	Credits			Total Contact Hours
		Theory	Practical	Total	
GEO-350	Geography of Resources (Major)	4	-	4	60
GEO-351	Regional Geography of South East Asia (Major)	4	-	4	60
GEO-352	Methods of Data Collection and Field Techniques (Major)	4	-	4	60
GEO-353	Field Study and Project Report (Major)	-	4	4	120
VTC-360…369	Any of the available course as notified by the University from time to time	1	3	4	105
				20	

Distribution of marks

Semester	Code No	Name of the paper	T	P	CA (T)	CA (P)	Total Marks
I	GEO-100	**Introduction to Human Geography**	75	-	25	-	100
II	GEO-150	**Introduction to Physical Geography**	75	-	25	-	100
III	GEO-200	**Regional Geography of India**	75	-	25	-	100
	GEO-201	**Historical Development of Geography**	75	-	25	-	100
IV	GEO-250	**Settlement Geography**	75	-	25	-	100
	GEO-251	**Fundamentals of Economic Geography**	75	-	25	-	100
	GEO-252	**Statistical Techniques in Geography**	-	75	-	25	100
	GEO-253	**Thematic Cartography and Survey Techniques I**	-	75	-	25	100
V	GEO-300	**Thematic Cartography and Survey Techniques II**	-	75	-	25	100
	GEO-301	**Population Geography**	75	-	25	-	100
	GEO-302	**Introduction to Remote Sensing and GIS (Major)**	-	75	-	25	100
	GEO-302	**Geography and Environment (Minor)**	75	-	25	-	100
	GEO-303	**Internship/Apprenticeship/Community engagement and service/ field based learning or minor project**		75		25	100
VI	GEO-350	**Geography of Resources**	75	-	25	-	100
	GEO-351	**Regional Geography of South East Asia**	75	-	25	-	100
	GEO-352	**Methods of Data Collection and Field Techniques**	75	-	25	-	100
	GEO-353	**Field Study and Project Report**	-	75	-	25	100

(T) = Theory; (P) = Practical; CA = Continuous Assessment

FIRST SEMESTER
Course Code: GEO-100
Course Title: INTRODUCTION TO HUMAN GEOGRAPHY
Total Contact Hours 60/Total Credits 4/Total Marks 100

Course Objective: To enable the students to understand the major themes in human geography

***Learning Outcome*:** Students will acquire an understanding and appreciation on the relationship between geography and society

Unit I – Introduction: Geography and its branches; geography as a study of relationship between human and physical environment (determinism and possibilism); relationship of geography with other disciplines; nature and scope of human geography.

Unit II - Economic Geography: Approaches to the study of economic geography; classification of economic activities; types of agricultural practices.

Unit III - Population Geography: Growth, distribution, density of human population in the world; concepts of optimum, over and under population; migration
- definition, types.

Unit IV – Political Geography and Social Geography: History and development of political geography; attributes of states - frontiers and boundaries; basic concept of geopolitics; human races and its distribution; languages - classification and distribution.

Suggested Readings:

Bergman. E.F. (1995): *Human Geography-Culture, Connections and Landscape*, Prentice Hall, New Jersey.

Dikshit R.D. (1994): *The Art and Science of Geography, Prentice Hall of India*, New Delhi.

Dikshit R.D. (2000): *Geographical Thought-A Contextual History of Ideas*, Prentice Hall of India, New Delhi.

Dikshit, R.D. (2000): *Political Geography: The Spatiality of Politics*, Tata McGraw Hill, New Delhi.

Hartshorne, R. (1959): *Perspective on the Nature of Geography*, McNally and Co., Chicago.

Harvey, D. (1972): *Explanations in Geography*, Edward-Arnold, London.

Holt, J.A. (2001): *Geography; Its History and Concept*, Longman, London.

Husain, M. (1984): *Evolution of Geographical Thoughts*, Rawat Publications, Jaipur.

James, R. (2010): *The Cultural Landscape-An Introduction to Human Geography*, Prentice Hall of India, New Delhi.

Knox, P.L. and Marston Sallie (2001): *Places and Regions in Global Context: Human Geography* (2nd Edn.), Prentice Hall, New Jersey.

Singh, L.R. (2002): *Fundamentals of Human Geography*, Sharda Pustak Bhawan, Allahabad.

SECOND SEMESTER
Course Code: GEO-150
Course Title: INTRODUCTION TO PHYSICAL GEOGRAPHY
Total Contact Hours 60/Total Credits 4/Total Marks 100

***Course Objective*:** To enable students in understanding the linkages between landscape form and processes, the factors that influence the earth's climate and the relationship between biotic and abiotic components.

***Learning Outcome*:** Students will be able to explain the basic principles of the development of landforms through time. It also explains how the physical system plays a role in supporting lifeforms on the earth.

Unit I - Geo-tectonics: Interior of the earth; geological timescale; continental drift, sea floor spreading and plate tectonics; folds and faults.

Unit I - Geomorphology: Development of geomorphology; basic geomorphological concept; geomorphic processes: weathering, erosion and mass wasting; geomorphic forms: fluvial and glacial.

Unit III – Climatology: Heat budget; classification of air masses, fronts, cyclones and anti-cyclones; Koppen's scheme of classification of world climates.

Unit IV – Oceanography: Ocean floor configuration (Pacific, Atlantic & Indian): ocean currents (Pacific, Atlantic & Indian); coral reefs: classification and distribution.

Suggested Readings:

Ahmad, E. (2001): *Physical Geography*, Kalyani Publishers, New Delhi.

Barry, R.G. and R.J. Chorley (2010): *Atmosphere, Weather and Climate,* Routledge, London and New York.

Critchfield, H. (1975): *General Climatology*, Prentice Hall, New York.

Dayal, P. (1996): *A Textbook of Geomorphology*, Shukla Book Depot, Patna.

Hagget, R. J. (2003): *Fundamentals of Geomorphology*, Routledge, London.

Kale, V.S. and Gupta Abhijit (2001): *Introduction to Geomorphology*, Orient Longman, Calcutta.

Lal, D.S. (2005): *Climatology*, Sharda Pustak Bhawan, Allahabad.

Negi, B.S. (2002): *Climatology and Oceanography*, Kedar Nath Ram Nath, Meerut.

Sarkar, Ashis (2015): *Systematic Geography: A Systematic Approach*, Orient Blackswan Private Limited, New Delhi

Sharma, Y.K. (2007): *Physical Geography*, Lakshmi Narain Agarwal, Agra.
Sharma, R.C. and M. Vatal (2018): *Oceanography for Geographers*, Surjeet Publications, New Delhi.
Thornbury, W.D. (1960): *Principles of Geomorphology*, John Willey & Sons, New York.
Ramkrishna Maiti (2023): *Geotectonics and Geomorphology*: An Insight into Process-Form Relationship, Nabodaya Publications, Kolkata.

THIRD SEMESTER
Course Code: GEO-200
Course Title: REGIONAL GEOGRAPHY OF INDIA
Total Contact Hours 60/Total Credits 4/Total Marks 100

Course Objective: To acquaint the students to geographical background, economic, human and resources of India and North East India.

Learning Outcome**:** Students will be able to identify India's geographic location, major physical features, population distribution and population diversity. They will analyse the role of agriculture in the economy, evaluate the management of natural resources, and describe the geography and strategic importance of North East India.

Unit I - Physical Environment: Physiography; drainage; climate; soil; natural Vegetation.

Unit II - Human Environment: Growth, distribution and density of population in India since Independence and associated problems; literacy composition; urban growth and process of urbanisation.

Unit III - Resources and Economic Regions: Energy (coal, petroleum); minerals (iron ore, manganese); agricultural resources (tea and rice); agricultural Regions (ICAR, 1982) and their characteristics; industrial regions and their characteristics.

Unit IV - Regional Study of North East India: Physiography and climate; composition of population: tribes, literacy and linguistic groups; types and characteristic of agricultural practices; types and distribution of industries: Cottage and Small Scale.

Suggested Readings:

Dikshit, K.R. et al (2014): *North-East India: Land, People and Economy*, Advances in Asian Human Environment Research, Springer, New York-London.

Gautam, A. (2006): *Advanced Geography of India*, Sharda Pustak Bhawan, Allahabad.

Gopalakrishnan, R. (1991): *North-East India: Land, People and Economy*, Vikash Publishing House, New Delhi.

Khullar, D. (2000): *India-A Comprehensive Geography*, Kalyani publishers, New Delhi.

Mathur, S. M. (2004): *Physical Geography of India*, National Book Trust of India, New Delhi Mamoria,C.B. (1980): *Economic and Commercial Geography of India*, Shiva Lal Agarwala, Agra.

Nag, P. and Roy, P. (1998): *Geography of India*, Concept Publications, New Delhi.

Paul, S. (1967): *Physical Geography of India*, Orient Longman, Calcutta.
Shafi, M. (2000): *Geography of South Asia*, McMillan &Co., Calcutta.
Sharma, Suresh Kant & Usha Sharma (2015): Discovery of North-East India: Geography, History
Singh, R.L. (1971): *India: A Regional Geography*, The National Geographic Society, Varanasi.
Spate, O.H.K. and A.T. Learmonth (1967): *India and Pakistan: A General and Regional Geography*, Methuen & Co., London.
Taher, M. and Ahmed, P. (1998): *Geography of North East India*, Eldorado Publications, Guwahati.
Tirtha R. and Gopal Krishnan R. (1996): *Emerging India*, Rawat Publications, Jaipur
Tirtha, R. (1996): *Geography of India*, Rawat Publications, Jaipur.

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THIRD SEMESTER
Course Code: GEO-201
Course Title: HISTORICAL DEVELOPMENT OF GEOGRAPHY
Total Contact Hours 60/Total Credits 4/Total Marks 100

Course Objective: This course aims to provide knowledge on the historical developments of geography and it also aims to enable students to contextualize the conceptual traditions within geography along with the major philosophical influences.

Learning Outcome: Students will develop a deep understanding of the evolution and philosophical influence of geography while exploring its contemporary relevance and engaging with emerging theories and areas within the field.

Unit I - Development of Geographical ideas in the Ancient and Medieval periods: Contribution of India to geographical concepts; Greek and Roman scholars; Arab scholars.

Unit II - Development of Modern Geography: Humboldt; Ritter; Ratzel; Blache.

Unit III - Dualism in Geography: Physical and human; determinism and possibilism; systematic and regional.

Unit IV - Schools of Thought: German; French; British; American.

Suggested Readings:

Adhikari, S (2015): *Fundamentals of Geographical Thought*, Orient Blackswan Private Limited, New Delhi

Bunge, W. (1966): *Theoretical Geography*, Lund University, Royal University of Lund, Dept. of Geography; Gleerup

Chorley, R.J.(1967): *Models in Geography*, Methuen, London

Dubey, B. (1967): *Geographical Concept in Ancient India*– NGSI, Varanasi

Dickinson, R.G. (1969): *The Makers of Modern Geography*, Routledge Kegan Paul, London

Dikshit, R.D. (2018): *Geographical Thought: A Conceptual History of Ideas*, PHI Learning Pvt Ltd, New Delhi

Hartshorne, R. (1939): The Nature of Geograp*hy*, Association American Geography.

Hussain, M: *Evolution of Geographical Thought*, Rawat Publication, Jaipur

Misra, R.P. (1983 ed.): *Contributions to Indian Geography Concepts and Approaches,* Heritage Publication, New Delhi.

Taylor, G (1953 ed.): *Geography in the 20th Century*, Methuen, London

Wooldridge, S.W. (1960): *Geographer as a Scientist*, London

Peet, Richard (1998). *Modern geographic thought*, Blackwell Publishers, Oxford
Ramkrishna Maiti & Moumita Moitra Maiti (2024): *Development Of Geographical Thought* , Nabodaya Publication, Kolkata.

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FOURTH SEMESTER
Course Code: GEO-250
Course Title: SETTLEMENT GEOGRAPHY
Total Contact Hours 60/Total Credits 4/Total Marks 100

***Course Objective*:** To enable the students to understand the type of settlements and the concept and theories on urban settlement.

Learning Outcome: Students will develop a comprehensive understanding of settlements and their morphology, including diverse housing types. They will critically evaluate urban settlement concepts and theories, while also grasping the functional classifications of urban settlements, with a specific focus on India.

Unit I – Introduction: Definition, nature and scope of settlement geography; types and characteristics: rural and urban; factors influencing growth and distribution of settlements.

Unit II - Rural settlement: Origin and growth of rural settlements; types and pattern of rural settlements; factors responsible for evolution of rural settlements.

Unit III - Urban Settlement: Origin and growth of urban settlements; functional classification of urban settlements; urban land use and morphology.

Unit IV - Settlement Hierarchy: Concept of rural urban fringe; central place theory (Christaller); rank size rule and primate city concept (Zipf).

Suggested Readings:

Ambrose, Peter (1970): *Concepts in Geography Vol.-I Settlement Pattern*, Longman

Baskin, C. and W. Christaller, (1966), *Central Places in Southern Germany*, Prentice-Hall Inc., New Jersey

Ghosh S (1998): *Introduction to Settlement Geography*, Sangam Books Ltd

Ghosh, Sumita (1998): *Introduction to Settlement Geography*, Sangam Book Ltd, Lucknow

Haggett, Peter, Andrew D. Cliff and Allen Frey (1979): *Locational Analysis in Human Geography*, London

Hudson, J.C. (1969): *A Location Theory for Rural Settlement*, Annals of the Association of American Geographers, Vol. 59, No. 2 (Jun., 1969), pp.365-381, Published by: Taylor & Francis, Ltd. on behalf of the Association of American Geographers

Khullar, D.R. (2011): *India: A Comprehensive Geography*, Kalyani Publishers, New Delhi

King, Leslie, J., (1986): *Central Place Theory*, Sage Publications, New Delhi

Mayer, M. Harold and Clyde F. Kohn (1967): *Readings in Urban Geography*, Central Book Depot, Allahabad

Prakasa, Rao, V.L.S.,(1983): *Urbanisation in India*; Spatial Dimensions, Concept Publishing Co., New Delhi

Ramachandran, R.,(1992): *Urbanisation and Urban Systems in India*, Oxford University Press, New Delhi

Singh R.L. and Kashi Nath Singh (1975): *Readings in Rural Settlement Geography*, National Geographical Society of India, Varanasi

Singh, R.Y. (1994): *Geography of Settlements*, Rawat Publication, New Delhi

Srinivasan, K. and M. Vlassoff, (2001): *Population-Development Nexus in India*: Challenges for the New Millennium, Tata McGraw-Hill Publishing Co. Ltd., New Delhi

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FOURTH SEMESTER
Course Code: GEO-251
Course Title: FUNDAMENTALS OF ECONOMIC GEOGRAPHY
Total Contact Hours 60/Total Credits 4/Total Marks 100

Course Objective: This course offers an introduction to the ways in which economic activities are organized on the earth's surface.

Learning Outcome: Students will understand the basic concepts in Economic Geography, the different types of economic activities and the factors affecting location of economic activity

Unit I –Basic Concepts: Definition, nature and scope; basic characteristics of developed and developing economies; concept of resources; classification of resources.

Unit II - Primary sector and related activities: Agricultural systems of the world (Whittlesey): (a) Intensive subsistence (b) Extensive commercial grain farming and (c) Plantation farming; Von Thunen's theory; world distribution of petroleum, coal, iron ore.

Unit III - Secondary sectors and related activities: Factors affecting industrial location; theory of industrial location (Weber); classification of manufacturing industries; world distribution of iron and steel, automobiles and cotton textile industries.

Unit IV - Tertiary, quaternary and quinary activities: International trade: WTO (aims, objectives and functions); modes of transportation: land & water; trade blocs: South Asia; service industries: Information technology enabled services and tourism.

Suggested Readings:

Chapman, J.D. (1989): *Geography and Energy*, Longman, London

Cryson, J., Henry, N., Keeble, D. and Martin, R. (2004): *The Economic Geography Reader*, John Willey & Sons. Ltd., Chichester.

Gautam A. (2015): *Advanced Economic Geography*, Sharda Pustak Bhavan, Uttar Pradesh.

Guha, J. L. (1998): *New Approach to Economic Geography*, World Press, Kolkata.

Hartshorne, T.N. and Alexander, J.W. (1988): *Economic Geography*, Prentice Hall, New Delhi.

Husain, Majid (1993): *Perspectives in Economic Geography*. Vol. I-VIII, Anmol Publications, New Delhi

Jones, C.F. and Darkenwald, G.G. (1997): *Economic Geography*, McMillan Co., New York.

Lee, R. and Wills, J. (1997): *Geography of Economies*, Arnold, London

Leong, G.C. and Morgan, G.C. (1982); *Human and Economic Geography*, Oxford university Press, London.

Peet, Richard(1999): *Theories of Development*, Rawat Publication, Jaipur.

Roy K Pritwish. (2014): *Economic Geography*, New Central Book Agency, 6th Edition.

Smith, D.M. (1971): *Industrial Location-An Economic Geographical Approach*, John Willey, New York.

Thakur, A.K. (2011): *Economic Geography and Development*, Lakshmi Publ., Guwahati.

Thoman,Richard G and Peter B. Corbin(1974): *Geography of Economic Activity*, McGraw-Hill Series in Geography. New York.

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FOURTH SEMESTER
Course Code: GEO-252
Course Title: STATISTICAL TECHNIQUES IN GEOGRAPHY
Total Contact Hours 120/Total Credits 4/Total Marks 100

Course Objective: To introduce quantification techniques in geography and their applications

Learning Outcome: Students will enable to learn the significance of statistics and its application in geography and the basic statistical techniques used in geography

Unit I - Introduction and frequency distribution: Statistical methods in geography: definition, types and significance; frequency: histogram, frequency curve; cumulative frequency, ogive.

Unit II - Measures of central tendency and dispersion: Mean, median and mode; quartile deviation, mean deviation, standard deviation, coefficient of variation.

Unit III - Correlation and regression analysis: Types and methods of correlation – scatter diagram; Karl Pearson's coefficient of correlation; Spearman's rank correlation; regression analysis: simple linear.

Unit IV - Time Series analysis and index numbers: Time series analysis (moving & semi average method); index number (unweighted and weighted).

Suggested Readings:

Alvi Z (2002): *Statistical Geography: Methods and Applications*, Rawat Publication, Jaipur

Berry B. J. L. and Marble D. F. (1968): *Spatial Analysis – A Reader in Geography*, Prentice- Hall, Inc., Englewood Cliffs

Burt, J. E., Barber, G. M., & Rigby, D. L. (2009). *Elementary statistics for geographers*, Guilford Press.

Das, N.G. (2011): *Statistical Methods (Volume 1 & 2)*, McGraw Hill Company

Ebdon D., (1977): *Statistics in Geography: A Practical Approach*, Blackwell, Oxford.

J. Chapman, Charles (2000): *An Introduction to Statistical Problem Solving in Geography*, McGraw Hill

King, L. S., (1969): *Statistical Analysis in Geography*, Prentice-Hall

Mahmood, Aslam (1977): *Statistical Methods in Geographical Studies*, Rajesh Publications, New Delhi

Pal, S. K., (998): *Statistics for Geoscientists*, Tata McGraw Hill, New Delhi

Peter, A. Rogerson (2014): *Statistical Methods for Geography*: A Student's Guide, University of Buffalo, USA

Sarkar, A. (2013): *Quantitative geography: techniques and presentations*, Orient Black Swan Private Ltd., New Delhi

Silk J.,(1979): *Statistical Concepts in Geography*, Allen and Unwin, London

Spiegel, M. R& Stephens, L.J.,(2008): *Statistics, Schaum's Outline Series*, McGraw Hill Education Pvt Ltd.

Yeates, M., (1974): *An Introduction to Quantitative Analysis in Human Geography*, McGraw Hill, New York

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FOURTH SEMESTER

Course Code: GEO-253

Course Title: THEMATIC CARTOGRAPHY AND SURVEY TECHNIQUES - I

Total Contact Hours 120/Total Credits 4/Total Marks 100

Course Objective: To introduce and familiarised the students on the significance and uses of cartograms, thematic mapping, map projections and survey techniques

Learning Outcome: Students will be able to comprehend the concept of scales and representation of data through cartograms. They will also develop an understanding of various thematic mapping techniques and their applications. Additionally, students will gain proficiency in using surveying instruments for geographic purposes.

Unit I - Scales and cartogram: Linear, diagonal & comparative scales; scale of maps: enlargement and reduction of maps (square method); pie and sphere diagrams.

Unit II - Map projections: Map projections: definition, properties and classification; construction, properties and uses of: Polar Zenithal Gnomonic projection, Simple Conical projection with two standard parallels, Cylindrical Equal Area projection.

Unit III - Thematic mapping: Point method: uniform dots for population distribution; line method: traffic flow; choropleth method: population density.

Unit IV – Surveying: Prismatic compass: open and closed traverse; plane table: radial and intersection methods.

Suggested Readings:

Kanetkar, T.P. and Kulkarni S.V. (1974, 1981): *Surveying and levelling, Vol. I and II*, Vidyarthi GrihaPrakashani, Pune.

Misra, R. P. and Ramesh A. (2002): *Fundamentals of Cartography, Concept* Publishing House, New Delhi.

Monkhouse, F.J. and Wilkinson, H.R. (1989): *Maps and Diagrams (Reprint),* B.I. Publications, New Delhi.

Robinson, Arthur et al., (1978); *Elements of Cartography,* John Wiley and Sons, New York.

Sarkar,A. (1997):*Practical Geography*, Orient Longman, Kolkata

Singh, L.R. (2006): *Fundamentals of Practical Geography,* Sharda Pustak Bhawan, Allahabad.

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FIFTH SEMESTER

Course Code: GEO-300

Course Title: THEMATIC CARTOGRAPHY AND SURVEY TECHNIQUES - II

Total Contact Hours 120/Total Credits 4/Total Marks 100

Course Objective: To enable the students to read maps, understand on the significance and uses of cartograms, thematic mapping, map projections and survey techniques

Learning Outcome: Students will acquire the following abilities: comprehending the concept of scales and data representation through cartograms, developing an understanding of various thematic mapping techniques and effectively utilizing surveying instruments for geographic purposes.

Unit I - Map reading and thematic map: Interpretation of topographical maps (physical and cultural elements); interpretation of weather maps; isopleth method: temperature and rainfall.

Unit II - Landform identification and analysis: Interpretation of landforms with the help of serial, superimposed, projected and composite profiles; slope analysis: Smith's and Wentworth's methods.

Unit III – Projections (construction, properties and uses): Polar Zenithal Stereographic projection; Bonne's projection; Mercator's projection.

Unit IV - Surveying and levelling: Levelling by Dumpy level; theodolite: determination of height and distance (accessible and inaccessible).

Suggested Readings:

Kanetkar, T.P. and Kulkarni S.V. (1974,1981): *Surveying and levelling, Vol. I and II,* Vidyarthi Griha Prakashani, Pune. Misra, R. P. and Ramesh A. (2002): *Fundamentals of Cartography*, Concept Publishing House, New Delhi.

Monkhouse, F.J. and Wilkinson, H.R. (1989): *Maps and Diagrams (Reprint),* B.I. Publications, New Delhi.

Robinson, Arthur et al., (1978); *Elements of Cartography*, John Wiley and Sons, New York.

Sarkar, A. (1997): *Practical Geography*, Orient Longman, Kolkata

Singh, L.R. (2006): *Fundamentals of Practical Geography*, Sharda Pustak Bhawan, Allahabad.

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FIFTH SEMESTER
Course Code: GEO-301
Course Title: POPULATION GEOGRAPHY
Total Contact Hours 60/Total Credits 4/Total Marks 100

Course Objective: To acquaint students on various kinds of demographic compositions and dynamics of the world

Learning Outcome: Students will understand population geography fundamentals, analyse demographic patterns and dynamics, explore theories such as Malthusian and Marxian views, and examine contemporary issues like the demographic transition model's applicability in India and the challenges and opportunities of the demographic dividend.

Unit I – Fundamentals: Definition, nature, scope and significance; development of population geography; sources of population data.

Unit II – Population size and composition: Regional patterns of population growth and distribution; age and sex; literacy; occupation.

Unit III – Dynamics of Population: Fertility: determinants and patterns; mortality: determinants and patterns; mobility: determinants and consequences.

Unit IV – Theories and contemporary issues: Malthusian theory; Marxian view; demographic transition model and its applicability in India; demographic dividend and challenges.

Suggested Readings:

Bogue, D.J. (1969): *Principles in Demography*, John Wiley, New York

Bose, A. et al. (1974): *Population in India's Development (1947-2000)*, Vikas Publication House, New Delhi

Chandna, R.C. (2000): *Geography of Population*, Kalyani Publ., New Delhi

Clarke, John I. (1973): *Population Geography*, Pergamon Press, Oxford

Crook, Nigel (1997): *Principal of Population and Development*, Pergamon Press, New York.

Gamier, B. J. (1970: *Geography of Population*, Longman, London

Hassan, M.I. (2022): *Population Geography: A Systematic Exposition*, Routledge, London

Mamoria, C.B. (1981): *India's Population Problems*, Kitab Mahal, New Delhi

Mitra, Ashok (1978): *India's Population Problems and Control (Vol. I & II),* Kitab Mahal, New Delhi

Mitra, Ashok (1991): *India's Population: Heading Towards a Billion*, B.R Publ. Corp., New Delhi
Premi, M.K. (2007): *Population of India*, NBT, New Delhi
Srinivasan, K. and Vlassoff, M. (2001): *Population and Development Nexus in India, Challenges for the new Millennium*, Tata McGraw Hill, New Delhi
Sundaram K. V and Nangia, Sudesh (eds.) (1986): *Population Geography*, Heritage, New Delhi
Wood, R. (1979): *Population Analysis in Geography*, Longman, London
Zelinsky, Willbur (1966): *A Prologue to Population Geography*, Prentice Hall, New Jersey

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FIFTH SEMESTER
Course Code: GEO-302 (Major)
Course Title: INTRODUCTION TO REMOTE SENSING AND GIS
Total Contact Hours 120/Total Credits 4/Total Marks 100

Course Objective: To develop an understanding of remote sensing, GIS and GPS technologies and their potential applications.

Learning Outcome: A general understanding of the modern techniques applied in geographical studies and the potential of Remote Sensing, GIS and GPS. An understanding of GIS analysis workflow and the integrated applications in various domains of Geography

Unit I – Basic concepts of remote sensing and Geographical information system: Definition, history, scope of remote sensing and basic principles of remote sensing; definition, history, scope of GIS and components of GIS; definition, functions and uses of GPS.

Unit II - Applications of Remote Sensing: Visual interpretation of land use and land cover mapping using aerial photograph; visual interpretation of land use and land cover mapping using satellite image.

Unit III - Applications of GIS: Geo-referencing and map digitization using GIS software; thematic mapping (QGIS/ArcGIS/MapInfo/Ilwiss).

Unit IV – Applications of Global Positioning System: Determination of Ground Control Points (GCPs) using GPS; survey and mapping using GPS: point, line and polygon-based mapping.

Suggested Readings:

Bonham-Carter, G. (1994): *Geographical Information System for Geoscientists: Modelling with GIS*, Pergamon Press, Oxford.

Burrough, P. A. and McDonnell, R.A. (1998): *Principles of Geographical Information System*, Oxford University Press, Oxford.

Davis, B.E. (2001): GIS: *A Visual Approach*, Onward Press, Canada.

Decker, D. (2001): *GIS: Data Sources*, John Willey and sons, U.S.A.

Kraak, Menno-Jan and Ormeling, F. (2004) *Cartography-Visualisation of Geospatial Data*, Pearson Education, U.K.

Malone, L. (2005): *Mapping Our World: GIS Lessons for educators*, ESRI Press, California

Misra, R. P. and Ramesh A. (2002): *Fundamentals of Cartography*, Concept Publishing House, New Delhi.

Panigrahi, N. (2008): *Geographical Information System*, University Press, Bangalore.
Robinson, Schuuman, N. (2004): *GIS: A Short Introduction*, Blackwell, U.K.
Singh, L.R. (2006): *Fundamentals of Practical Geography*, Sharda Pustak Bhawan, Allahabad. Sinton, D.S. & Jennifer J. Lund (2007): *Understanding Place: GIS and Mapping Across the Curriculum*, ESRI Press, California.
Steingberg, S. J. and Steingberg, Sheila S. (2006): *GIS: Geographical Information System for Investigating Space and Place*, Sage Publications, London.
Stilwel, J. and Clarke, G. (2004): *Applied GIS and Spatial Analysis*, John Willey & Sons, USA.

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FIFTH SEMESTER
Course Code: GEO-302 (Minor)
Course Title: GEOGRAPHY AND ENVIRONMENT
Total Contact Hours 60/Total Credits 4/Total Marks 100

Course Objective: Understanding the diverse themes and challenges within environmental geography entails examining anthropogenic interventions and their subsequent impacts on a multitude of ecosystems

Learning Outcome: Students will acquire an understanding of ecosystems, encompassing their components, interactions and ecological processes, as well as an in-depth knowledge of various anthropogenic interventions, their impacts on ecosystems, conservation strategies and environmental planning practices designed to mitigate adverse effects and foster sustainability.

Unit I - Introduction to environmental geography: Definition, nature, scope and significance; components of the environment; environmental geography and related sciences.

Unit II - Ecosystem: structure and functions: Meaning and concept of an ecosystem; components of ecosystem; energy flow in the ecosystem: food chain and food web.

Unit III - Issues related to environmental degradation: Human impact on the environment: land and water; global warming: causes and consequences; causes and effects of natural hazards: tsunami, drought and floods; causes of biodiversity loss.

Unit IV - Environmental management and conservation: Objectives and goals of sustainable development; environment impact assessment (EIA); in-situ and ex-situ conservation of biodiversity.

Suggested Readings:

Chandna R. C., (2002): *Environmental Geography*, Kalyani, Ludhiana

Cunninghum W. P. and Cunninghum M. A., (2004): Principles of Environmental Science: Inquiry and Applications, Tata McGraw Hill, New Delhi

Gautam, Alka (2007): *Environmental Geography*, Sharda Pustak Bhawan Publication, New Delhi Goudie A., (2001): The Nature of the Environment, Blackwell, Oxford

Singh, R.B. (Eds.) (2009) *Biogeography and Biodiversity*, Rawat Publication, Jaipur

Miller G. T. (2004): *Environmental Science: Working with the Earth*, Thomson Brooks Cole, Singapore

MoEF, (2006): *National Environmental Policy-2006,* Ministry of Environment and Forests, Government of India

Odum, E. P. et al, (2005): *Fundamentals of Ecology*, Thomson Brooks/Cole Singh S., (1997): Environmental Geography, Prayag Pustak Bhawan, Allahabad.

UNEP (2007): *Global Environment Outlook: GEO4: Environment for Development*, United Nations Environment Programme

Singh, R.B. (1998): *Ecological Techniques and Approaches to Vulnerable Environment,* Oxford & IBH Publication, New Delhi

Singh, R.B. and Hietala, R. (Eds.) (2014): *Livelihood security in North-western Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India, Advances in Geographical and Environmental Studies*, Springer

Saxena H. M. (1999): *Environmental Geography*, Rawat Publications, Jaipur and New Delhi

Singh R. B. (ed) (2006): *Natural Hazards and Disaster Management: Vulnerability and Mitigation*, Rawat Publications, New Delhi

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SIXTH SEMESTER
Course Code: GEO-350
Course Title: GEOGRAPHY OF RESOURCES
Total Contact Hours 60/Total Credits 4/Total Marks 100

Course Objective: To enable students to uncover the rich resources in the world. Students will gain knowledge on the classification of resources and different types of natural resources and environmental consequences from using of these resources

Learning Outcome: Students will understand the concept and classification of resources, analyse issues related to resource depletion, comprehend Sustainable Resource Development principles, grasp the distribution of biotic and abiotic resources and assess the energy crisis alongside potential future scenarios.

Unit I - Basic concepts: Definition, classification and significance of resources; human resource; population - resource regions (Ackerman); human development index.

Unit II - Biotic and abiotic resources: Global distribution of forest resources; global distribution of marine fishing: over-fishing and consequences; global distribution of energy: conventional (natural gas), non-conventional (solar and wind); global distribution of minerals: copper and limestone.

Unit III - Resource, development and environment: Environment - development dilemma; territorial conflict in use of water resources (Indus and Cauvery); environmental consequences of natural resource consumption: pollution.

Unit IV - Resource conservation: Principles of conservation: efficiency in uses, recycling and substitutions; food security; water conservation; concept of sustainability.

Suggested Readings:

Blanco, E. and Razzaque., J. (2011): *Globalization and National Resources, Law, Challenges, Key Issues and Perspective*, Edward Elgar Publ., U.K.

Brundtland, G.H. (1987): *Our Common Future, UNCED Report*, Geneva.

Leong, Goh Cheng (1995): *Certificate Physical and Human Geography*, Oxford Univ., Press, Oxford Coe, N., Kelly, P. and Yeung, H.W.C. (2007): *Economic Geography: A Contemporary Introduction, John Wiley and Sons*, New York.

Dicken, P. (2007): *Global Shift: Mapping the changing contours of the world economy*, Sage Publ., New York

Mackinnon, D. and Cumbers, A. (2007): *An Introduction to Economic Geography: Globalization, Uneven Development and Place*. Prentice Hall, New Jersey.

Parman, S.S. (2002): *Geography, Economics and Economic Geography*, ASD Publication, Pune.
Roy, Prithwish (2005): *Economic Geography: A Study of Resources*, New Central Book Agency, Kolkata
Simmons, I.G. (1980): *The Ecology of Natural Resources*, Edward Arnold, London
Simmons, I.G. (1991): *Earth, Air and Water: Resources and Environment in the 20th Century*, Edward Arnold, London
Wiebe, K. (2003): *Land Quality Agricultural productivity and Food Security*, Edward Elgar Publication, U.K.

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SIXTH SEMESTER
Course Code: GEO-351
Course Title: REGIONAL GEOGRAPHY OF SOUTH EAST ASIA
Total Contact Hours 60/Total Credits 4/Total Marks 100

Course Objective: To sensitise the students on topics of physiography, demographic composition, resources and trade of South East Asian countries.

Learning Outcome: Students will be able to understand the geography of South East Asia and the important role played by these countries in relation to India and to the world.

Unit I - Physical geography: Physiography and drainage; climate; soil; natural vegetation**.**

Unit II - Human geography: Population distribution and growth; ethnicity and peopling; linguistic composition and distribution.

Unit III - Resources and economic activities: Types and characteristics of agricultural practices; crops (rice and coffee); minerals (iron ore and tin) and energy (coal and petroleum); location and distribution of manufacturing Industries (textile and electronics).

Unit IV - External trade: External Trade of South East Asia with special reference to India; role of ASEAN in global economy; economic resurgence.

Suggested Readings:

Blij H. & Muller, O (1993): *Geography, Regions and Concepts*, John Wiley, New York

Chia Lin Sien (2003): *Southeast Asia Transformed: A Geography of Change*, Institute of Southeast Asian Studies

Cole,J (1996): *A Geography of the World Major Regions*, Routledge. London

Don R.H.(Ed)(1980): *Essentials of Geography and Development*, McMillian, New York

Gupta Avijit, (2005): *Physical Geography of South East Asia*, OUP

Jackson, R.H. and Hudman L.E. (1991): *World Regional Geography: Issues for today,* John Wiley New York

Ward, P.W and A Miller (1989): *World Regional Geography: A Question of place*, John Wiley, New York

Ba, A. D. (2009): *Negotiating East and Southeast Asia Region*, Regionalism, Association of Southeast Asian Nations, Stanford University Press.

Manku, D. S. (2013): *A Regional Geography of the World*, Kalyani Publisher, New Delhi

Nesadurai, H. E., & Djiwandono, S. E. (2009). *Southeast Asia in the Global Economy: Securing Competitiveness and Social Protection*. ISEAS/RSIS.

Severino, R. C. (2006). *Southeast Asia in search of an ASEAN Community: Insights from the Former ASEAN Secretary-General,* Institute of Southeast Asian Studies, Singapore

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SIXTH SEMESTER
Course Code: GEO-352
Course Title: METHODS OF DATA COLLECTION AND FIELD TECHNIQUES
Total Contact Hours 60/Total Credits 4/Total Marks 100

Course Objective: To introduce the understanding of data collection and field study-from data collection, methods and its analysis

Learning Outcome: Students will have a solid grasp of fundamental concepts in field methods and research design in geography, facilitating their ability to undertake fieldwork with practical experience. They will develop essential skills in data collection methods, processing and analysis, enabling them to effectively utilize obtained data for geographical research and analysis.

Unit I - Introduction to field study: Significance of field study in geography; basic principles; approaches and types.

Unit II - Research design: Review of literature and research gap; identifying a research problem; aims and objectives, research questions, methodology and study area.

Unit III - Methods of data collection: Collection of primary data: observation method, interview method, focus group discussion and questionnaire and schedule; sampling techniques; collection of secondary data: published and unpublished.

Unit IV - Processing and analysis of data: Data entry, processing and representation; types of analysis: qualitative and quantitative.

Suggested Readings:

Creswell J., (1994): *Research Design: Qualitative and Quantitative Approaches*, Sage Publications, New Delhi

Dikshit, R. D. (2003): *The Art and Science of Geography*: Integrated Readings, Prentice-Hall of India, New Delhi.

Evans, M., (1988): *Participant Observation: The Researcher as Research Tool in Qualitative Methods in Human Geography*, Barnes and Noble.

Mukherjee, Neelam (1993): *Participatory Rural Appraisal: Methodology and Application*, Concept Publications Co., New Delhi.

Mukherjee, Neela (2002): *Participatory Learning and Action: with 100 Field Methods*, Concept Publications Co., New Delhi

Robinson A., (1998): *"Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and*

Behavioural Sciences, eds. by F. Pryczak and R. Bruce Pryczak, Publishing, Los Angeles.
Special Issue on *"Doing Fieldwork" The Geographical Review* 91:1-2 (2001)
Stoddard R. H., (1982): *Field Techniques and Research Methods in Geography*, Kendall/Hunt.Wolcott, H. (1995): The Art of Fieldwork, Alta Mira Press, Walnut Creek, CA.

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SIXTH SEMESTER

Course Code: GEO-353
Course Title: FIELD STUDY AND PROJECT REPORT
Total Contact Hours 120/Total Credits 4/Total Marks 100

Course Objective: To enable students experience field work and get acquainted on research and research methods and also to write a field report based on the actual field survey. This field work will be evaluated externally.

Learning Outcome: Students will be able to identify suitable areas for case studies, selecting appropriate techniques and observations, preparing questionnaires and composing comprehensive field study reports. This will equip them with the necessary skills to undertake thorough geographical research and analysis effectively.

Marks distribution for end semester examination: Project Report 50, Presentation 15, Viva voce 10

Objectives:
A field report to be prepared and submitted individually based on actual field survey of an area under the supervision of one or more supervisor

Field study:
The Field survey should include the following:
1. Socio-economic survey and analysis
2. Physical survey techniques like Plane Table/Dumpy level/Theodolite/Prismatic compass/GPS
3. Statistical techniques
4. Cartographic techniques

Themes of field survey:
The Field survey should be related to the papers taken during the course.

Structure of the Report:
Full papers should be submitted in soft binding not exceeding 10000 words in A-4 size, Times New Roman 12 and 1.5 line spacing
Pages should contain illustrations (sketches, graphs, diagrams, maps, photographs, etc)
Documentation and preparation of the field report with the following format: Introduction, review of literature, research gap, statement of the problem, objectives, data source, methodology, study area, research design, data analysis, data representation, interpretation, summary and conclusion, bibliography/references, appendix.

Suggested Readings:

Creswell J., (1994): *Research Design: Qualitative and Quantitative Approaches*, Sage Publications, New Delhi

Dikshit, R. D. (2003): *The Art and Science of Geography: Integrated Readings*, Prentice- Hall of India, New Delhi.

Evans M., (1988): *"Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography*, eds. J. Eyles and D. Smith, Polity.

Misra, R.P. (2002): *Research Methodology*, Concept Publications, New Delhi.

Mukherjee, Neela (1993): *Participatory Rural Appraisal: Methodology and Application*, Concept Publications Co., New Delhi.

Mukherjee, Neela (2002). *Participatory Learning and Action: with 100 Field Methods*, Concept Publications Co., New Delhi

Robinson A., (1998): *"Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences*, eds. by F. Pyrczak and R. Bruce Pyrczak, Publishing: Los Angeles.

Special Issue on *"Doing Fieldwork" The Geographical Review* 91:1-2 (2001).

Stoddard R. H., (1982): *Field Techniques and Research Methods in Geography*, Kendall/Hunt.

Wolcott, H. (1995): *The Art of Fieldwork*. Alta Mira Press, Walnut Creek, CA.

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