SYLLABUS

FOUR YEARS UNDERGRADUATE PROGRAMME

IN

GEOGRAPHY

UNIVERSITY OF NORTH BENGAL

RAJA RAMMOHUNPUR

W.E.F: ACADEMIC SESSION 2023-24

Semester: 1

PAPER: MAJOR

Paper Description: GEOTECTONIC

This paper deals with geotectonic, scale, and diagrammatic data presentation topics. In particular, the theoretical part of the course will cover the internal structure of the earth, rocks, isostasy, earth movements, mountain building, continental drift theory, sea-floor spreading, plate tectonics and volcanicity, while the practical part will cover the construction of linear and comparative scale and diagrammatic data presentation using line, bar and circle.

Paper Code: UGEOMAJ11001

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Concept of geotectonic and earth's interior.
- Theories of mountain building.
- Continental drift, plate movements and volcanicity.

Skills Gained:

- Develop skills in constructing linear and comparative scales.
- Graphical representation of data using line, bar and circle diagrams.

Competency Developed:

- Develop skills in questioning, reasoning, and drawing logical conclusions based on evidence and scientific principles of various theories and concepts related to geotectonic.
- Enable students to interpret and visually communicate data effectively.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Geological time scale; Internal structure of the earth; Classification of rocks: Igneous, sedimentary and metamorphic; Theory of isostasy: Views of Airy and Pratt.	3
2	Earth movements, processes and topographic effects of folding and faulting; Classification of mountains; Theories of mountain building: Geosynclinal Theory of Kober, Thermal Contraction Theory of Jeffreys, Thermal Convection Current Theory of Holmes.	
3	Continental Drift Theory of Alfred Wegener; Concept of sea-floor spreading; Plate tectonics, plate boundaries and subduction zones; Concept of volcanicity; Classification of volcanoes; Volcanic landforms; World distribution of volcanoes.	

Practical

Unit	Content	Hours/Week
1	Scale: Definition and types; Construction of linear and comparative scale.	2
2	Diagrammatic data presentation: Line, bar (simple, compound and composite) and circle (pie graph, proportional circle and proportional divided circle).	

Suggested Reading

Monkhouse, F. J. (1974). *Principles of Physical Geography* (2009-reprint). Platinum Publishers.

Strahler, A. (2016). *Introducing Physical Geography*, 6th ed. Wiley.

Khullar, D. R. (2012). *Physical Geography*. New Delhi, India: Kalyani Publishers.

Mohan, K. (2018). *GES PERIODOS VOL 1, An Ultimate Guide to Physical Geography*. Oak Bridge Publication, New Delhi.

Kearey, P., Klepeis, K. A., & Vine, F. J. (2011). *Global Tectonics*, 3rd ed. Wiley-India.

Singh, S. (2022). *Physical Geography*. Pravalika Publications, Prayagraj.

Christopherson, R. W., & Birkeland, G. H. (2012). *Geosystems: An Introduction to Physical Geography* (8th edition). Pearson Education, New Jersey.

Das Gupta, A., & Kapoor, A. N. (2001). *Principles of Physical Geography*. S.C. Chand & Company Ltd. New Delhi.

Skinner, B. J., & Porter, S. C. (2000). *The Dynamic Earth: An Introduction to Physical Geology*, 4th Edition. John Wiley and Sons.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Mishra, R. P., & Ramesh, A. (1989). *Fundamentals of Cartography*. Concept, New Del

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 1

PAPER: SEC

Paper Description: DISASTER MANAGEMENT

This paper provides an overview of hazards and disasters, focusing on their definition, classification, and impacts. It examines the concepts of vulnerability and risk and explores various types of natural and human-induced disasters, including floods, droughts, landslides, earthquakes, cyclones, industrial hazards and pandemics. The course also introduces the principles and strategies of disaster management, including identification and risk assessment, risk reduction and preparedness and disaster response and recovery. In the practical part of the course, students work on a project report related to a specific hazard or disaster using secondary data sources.

Paper Code: UGEOSEC11001

Paper Type: Theory + Practical Lab Based-PLB

Credit: 2 credit theory and 1 credit practical.

Class Hours: 2 theory classes per week and 2 practical classes per week. Total 4 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Definition, concept and classification of hazards and disasters.
- Economic, social and environmental impacts of disasters.
- Concept and strategies of disaster management.

Skills Gained:

- Learn how to effectively organize and write a project report incorporating appropriate maps, diagrams, charts and tables.
- Develop skills required for teamwork, including collaboration, coordination, and task allocation, by working in groups under faculty members' supervision.

Competency Developed:

- Develop a comprehensive understanding of hazards and disasters, enabling them to recognize and assess potential risks and vulnerabilities in different contexts.
- Equip with the knowledge and skills necessary to contribute to the development of effective disaster management plans and strategies.
- Enhance critical thinking abilities by examining the causes, impacts and management strategies associated with hazards and disasters.

Syllabus Overview:

Theory

Unit	Content	Hours/Week
1	Definition and concept of hazards and disasters; Definition of vulnerability and risk; Classification of hazards and disasters; Economic, social and environmental impacts of disasters; Natural and human induced disasters like flood, drought, landslide, earthquake, cyclone, industrial hazards and pandemics.	2

2	Concept of disaster management; Strategies of disaster management: Identification and risk assessment, risk reduction and preparedness, disaster response and recovery.	

Practical

Unit	Content	Hours/Week
1	A project report will be prepared by the students in consultation with their respective college teachers on any type or individual cases of hazard and disaster. The report will be prepared based only on available secondary data sources. The report should be limited to 20-25 pages, handwritten and may include maps, diagrams, charts and tables. The report will be examined externally, and marks will be separately allotted for the report and viva-voce taken individually. Students will be divided into groups so that in each college, at least 4 groups are formed, and each group will prepare their report taking different topics under the supervision of the faculty members.	2

Suggested Reading

Pandey, M. (Year of publication). *Disaster Management*. Wiley India Pvt. Ltd.

Bhattacharya, T. (Year of publication). *Disaster Science and Management*. McGraw Hill Education (India) Pvt. Ltd.

Singh, J. (Year of publication). *Disaster Management: Future Challenges and Opportunities*. K W Publishers Pvt. Ltd.

Singhal, J. P. (Year of publication). *Disaster Management*. Laxmi Publications.

Pandharinath, N., & Rajan, C. K. (Year of publication). *Earth and Atmospheric Disaster Management: Natural and Man-made*. B S Publications.

Singh, R. B. (2005). *Risk Assessment and Vulnerability Analysis* (Chapters 1-3). IGNOU, New Delhi.

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

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Practical guidelines: Although the work on the project report will be done in groups, the students will have to carry their individual copies duly signed by their supervising teacher at the time of viva-voce.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: Project Report	5: Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 1

PAPER: MINOR

Paper Description: PHYSICAL GEOGRAPHY

This paper provides an overview of earth's physical systems and their dynamic processes. The theoretical part covers topics such as the interior of the earth, plate tectonics, weathering, erosion, and landforms. Additionally, it explores the composition and structure of the atmosphere, climate patterns, and climate change. The course also delves into oceanography, including temperature and salinity distribution, ocean currents, coral reefs, and sea level changes. The practical part focuses on construction of scale and map projection techniques. Overall, this course offers a comprehensive understanding of earth's geomorphological, atmospheric and oceanographic processes, enabling students to analyze and interpret various natural phenomena.

Paper Code: UGEOMIN10001

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Understanding of the interior of the Earth, including its composition and structure.
- Familiarity with the Continental Drift Theory proposed by Wegener and the concept of plate tectonics.
- Knowledge of various geological phenomena such as folds, faults, weathering, and mass movement.
- Understanding of erosional and depositional landforms formed by fluvial (river), glacial, and aeolian (wind) processes.
- Knowledge of the composition and structure of the atmosphere, including insolation and the heat budget.
- Understanding of temperature distribution, pressure belts, wind systems and different types of precipitation.
- Knowledge about cyclones, anti-cyclones and climate change.
- Understanding of the distribution of temperature and salinity in ocean water and the factors influencing ocean currents.
- Knowledge of coral reefs and theories of reef formation, including the contributions of Darwin and Daly.
- Awareness of sea level change and its implications.

Skills gained:

- Students will develop the ability to analyse geological processes, atmospheric phenomena and oceanic systems.
- They will learn to interpret maps, diagrams and data related to earth science.
- Students will acquire skills in constructing different types of map projections, including polar zenithal gnomonic, simple conical and cylindrical equal area projection.
- They will develop the ability to observe and identify geological and climatic features.

Competency developed:

- Students will develop critical thinking skills by analyzing and evaluating complex geological and atmospheric processes.
- Students will develop an understanding of the earth's natural systems and the impact of human activities on the environment.
- They will learn to interpret and analyse scientific data, including maps, charts and graphs, to draw conclusions and make informed decisions.
- Students will develop the ability to adapt to changes in the earth's systems and understand the dynamic nature of the planet.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Interior of the earth; Continental Drift Theory by Wegener; Plate tectonics; Folds and faults; Weathering and mass movement; Erosional and depositional landforms: Fluvial, glacial and aeolian.	3
2	Composition and structure of atmosphere; Insolation and heat budget; Temperature distribution, pressure belts, wind systems and precipitation types; Cyclones and anti-cyclones; Climate change.	
3	Distribution of temperature and salinity of ocean water; Ocean currents: Causes, types and their distribution over the Indian Ocean; Coral reefs and theories of reef formation after Darwin and Daly; Sea level change.	

Practical

Unit	Content	Hours/Week
1	Scale: Definition and types; Construction of linear, comparative and diagonal scale.	2
2	Map projection: Definition, classification, properties and uses; Mathematical/graphical construction of Polar Zenithal Gnomonic Projection, Simple Conical Projection with One Standard Parallel, Cylindrical Equal Area Projection.	

Suggested Reading

Ahmed, E. (1985). *Geomorphology*. Kalyani Publishers, New Delhi.

Khullar, D.R. (2012). *Physical Geography*. New Delhi, India: Kalyani Publishers.

Mohan, K. (2018). *GES PERIODOS VOL 1, An Ultimate Guide to Physical Geography*. OakBridge Publication, New Delhi.

Chorley, R.J., Schumm, S.A., & Sugden, D.E. (1984). *Geomorphology*. Methuen, London.

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

Thornbury, W.D. (2004). *Principles of Geomorphology*. New York, U.S.A.: Wiley.

Strahler, A.N. (1968). *The Earth Sciences*. Harper & Row Intl. Edn, New York.

Siddahartha, K. (2020). *Climatology, Atmosphere, Weather and Climate*. Kitaba Mahal Publication, New Delhi.

Lal, D.S. (1998). *Climatology*. Allahabad: Chaitanya Publishing House.

Singh, S. (2005). *Climatology*. Allahabad: Prayag Pustak Bhawan.

Barry, R.G., & Chorley, R.J. (2003). *Atmosphere, Weather and Climate*. Psychology Press, Hove; East Sussex.

Critchfield, H.J. (1975). *General Climatology*. Prentice Hall, New Jersey.

Garrison, T. (1998). *Oceanography*. Wordsworth Company, Belmont.

Kershaw, S. (2000). *Oceanography: An Earth Science Perspective*. Stanley Thornes, UK.

Sharma, R.C., & Vatal, M. (1980). *Oceanography for Geographers*. Chaitanya Publishing House, Allahabad.

Sverdrup, K.A., & Armbrust, E.V. (2008). *An Introduction to the World Ocean*. McGraw Hill, Boston.

Singh, R.L., & Singh, R.P.B. (1999). *Elements of Practical Geography*. Kalyani Publishers, New Delhi.

Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. Orient Black Swan Private Ltd., New Delhi.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 2

PAPER: MAJOR

Paper Description: SETTLEMENT GEOGRAPHY

This paper deals with topics such as settlement geography, scale, and map projection. In particular, the theoretical part of the course will cover the concept of site and situation, the morphology of rural and urban settlements, types, patterns, and distribution of rural settlements, theories of the origin of towns, theories of urban land use, primate cities, rank-size rule, and central place theory. The practical part will cover the diagonal and vernier scale construction and map projections.

Paper Code: UGEOMAJ12002

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Concept of site and situation, origin and growth of rural and urban settlements, as well as the types, patterns and distribution of rural settlements.
- Physical layout, structure, and form of rural and urban settlements.
- Theories of the origin of towns and urban land use and morphology.

Skills Gained:

- Develop skills in constructing diagonal and vernier scales.
- Expertise in the mathematical/graphical construction and properties of map projections.

Competency Developed:

- Analyzing the suitability of different locations for settlements and understand the factors that contribute to their success or decline.
- Understanding the morphological patterns will enable students to identify and analyse the characteristics of different settlement.
- Students will develop competency in constructing diagonal and vernier scales and equip with practical skills in map reading, interpretation, and cartographic analysis.

Syllabus Overview:

Theory

Unit	Content	Hours/Week
1	Definition, nature, scope and content of settlement geography; Concept of site and situation; Origin and growth of rural and urban settlements.	3
2	Types, patterns and distribution of rural settlements; Morphology of rural settlements; Theories of origin of towns after Childe and Mumford; Functional classification of urban settlements: A.Mitra; Urban landuse and morphology: Concentric Zone Theory, Sector Theory and Multiple Nuclei Theory.	

3	Settlement hierarchies; Concept of primate city and rank size rule; Central place theory by W. Christaller and A. Losch.	

Practical

Unit	Content	Hours/Week
1	Scale: Construction of diagonal and vernier scale.	2
2	Map projection: Definition, nature, properties, classification and uses; Mathematical / graphical construction of Polar Zenithal Gnomonic Projection, Polar Zenithal Stereographic Projection, Polar Zenithal Orthographic Projection, Cylindrical Equal Area Projection and Mercator Projection.	

Suggested Reading

Ghosh, S. (2006). *Introduction to Settlement Geography*. Orient Longman.

Singh, R.Y. (2002). *Geography of Settlements*. Rawat Publications.

Pacione, M. (2009). *Urban Geography: A Global Perspective*. Routledge.

Tiwari, R.C. (2020). *Settlement Geography: Rural and Urban Settlements*. Pravalika Publication.

Maurya, S.D. (2015). *Settlement Geography*. Sharda Pustak Bhawan.

Hussain, J. (2021). *Settlement Geography*. Notion Press.

Childe, V.G. (1950). *The Urban Revolution*. University of Chicago Press.

Johnston, R., Gregory, D., Pratt, G., et al. (2008). *The Dictionary of Human Geography*. Blackwell Publication.

Daniel, P.A., Hopkinson, M.F. (1989). *The Geography of Settlement*. Oliver & Boyd, London.

Singh, R.L., & Singh, R.P.B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. Orient Black Swan Private Ltd., New Delhi.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 2

Paper: SEC

Paper Description: SUSTAINABLE DEVELOPMENT

This paper provides a comprehensive understanding of sustainable development, focusing on its definition, concepts, and various elements such as social, economic, and environmental sustainability. It explores global issues related to sustainable development, including deforestation and soil erosion and examines key global initiatives in sustainable development, along with the Millennium Development Goals. In the practical part of the course, students work on a project report related to any topic or issue on sustainable development using secondary sources of data.

Paper Code: UGEOSEC12002

Paper Type: Theory + Practical Lab Based-PLB

Credit: 2 credit theory and 1 credit practical.

Class hours: 2 theory classes per week and 2 practical classes per week. Total 4 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Definition, concept and elements of sustainable development.
- Global challenges such as deforestation and soil erosion, their causes, impacts, and potential solutions.
- Key global initiatives and agreements aimed at promoting sustainable development.
- India's progress in achieving millennium development goals.
- Challenges and obstacles faced in implementing sustainable development strategies.

Skills gained:

- Students will learn how to effectively organize and write a project report incorporating appropriate maps, diagrams, charts and tables.
- By working in groups under the supervision of faculty members, students will develop skills required for teamwork; including collaboration, coordination, and task allocation.

Competency developed:

- Develop the ability to analyze complex sustainability issues critically, evaluate different perspectives and propose informed solutions.
- Foster a sense of responsibility and awareness among students towards environmental conservation and protection.
- Students will cultivate a sense of global citizenship and understand the interconnectedness of various regions and societies.

Syllabus Overview:

Theory

Unit	Content	Hours/Week
1	Definition and concept of sustainable development; Elements of sustainable development: Social sustainability, economic sustainability and environmental sustainability; Global issues related to sustainable development like deforestation and soil erosion.	2

2	Global initiatives in sustainable development like Ramsar Convention, Stockholm Conference and Earth Summit (Rio 1992); Millennium Development Goals; India's progress with respect to MDGs; Future trends and challenges of sustainable development.	

Practical

Unit	Content	Hours/Week
1	A project report will be prepared by the students in consultation with their respective college teachers on any issues or topics related to sustainable development. The report will be prepared based on available sources of secondary data only. Report should be limited within 20-25 pages, handwritten and may include maps, diagrams, charts and tables. The report will be examined externally and marks will be separately allotted for report and viva-voce taken individually. Students will be divided into groups so that in each college at least 4 groups are formed and each group will prepare their report taking different topics under the supervision of the faculty members.	2

Suggested Reading

World Commission on Environment and Development. (1987). *Our Common Future* (Brundtland Report).

Baker, S. (2006). *Sustainable Development*. New York, N.Y.: Routledge.

Singh, R.B. (Ed.) (2001). *Urban Sustainability in the Context of Global Change*. Science Pub., Inc., New Delhi, India: Enfield (NH), USA and Oxford & IBH Pub.

Osorio, L., et al. (2005). Debates on sustainable development: Towards a holistic view of reality. *Environment, Development and Sustainability, 7*(4), 501-518.

Muni, S.D., Chaturvedi, S. (Year). *India and the Millennium Development Goals: Progress and Challenges*.

Robertson, M. (Year). *Sustainable Development: Principles, Policies, and Practices*.

Mega, V.P. (Year). *Sustainable Development: Concepts, Rationalities and Strategies*.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Practical guidelines: Although the work on the project report will be done in groups, the students will have to carry their individual copies duly signed by their supervising teacher at the time of viva-voce.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: Project Report	5: Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 2

PAPER: MINOR

Paper Description: PHYSICAL GEOGRAPHY

This paper provides an overview of earth's physical systems and their dynamic processes. The theoretical part covers topics such as the interior of the earth, plate tectonics, weathering, erosion, and landforms. Additionally, it explores the composition and structure of the atmosphere, climate patterns, and climate change. The course also delves into oceanography, including temperature and salinity distribution, ocean currents, coral reefs, and sea level changes. The practical part focuses on construction of scale and map projection techniques. Overall, this course offers a comprehensive understanding of earth's geomorphological, atmospheric and oceanographic processes, enabling students to analyze and interpret various natural phenomena.

Paper Code: UGEOMIN10001

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Understanding of the interior of the Earth, including its composition and structure.
- Familiarity with the Continental Drift Theory proposed by Wegener and the concept of plate tectonics.
- Knowledge of various geological phenomena such as folds, faults, weathering, and mass movement.
- Understanding of erosional and depositional landforms formed by fluvial (river), glacial, and aeolian (wind) processes.
- Knowledge of the composition and structure of the atmosphere, including insolation and the heat budget.
- Understanding of temperature distribution, pressure belts, wind systems and different types of precipitation.
- Knowledge about cyclones, anti-cyclones and climate change.
- Understanding of the distribution of temperature and salinity in ocean water and the factors influencing ocean currents.
- Knowledge of coral reefs and theories of reef formation, including the contributions of Darwin and Daly.
- Awareness of sea level change and its implications.

Skills gained:

- Students will develop the ability to analyse geological processes, atmospheric phenomena and oceanic systems.
- They will learn to interpret maps, diagrams and data related to earth science.
- Students will acquire skills in constructing different types of map projections, including polar zenithal gnomonic, simple conical and cylindrical equal area projection.
- They will develop the ability to observe and identify geological and climatic features.

Competency developed:

- Students will develop critical thinking skills by analyzing and evaluating complex geological and atmospheric processes.
- Students will develop an understanding of the earth's natural systems and the impact of human activities on the environment.
- They will learn to interpret and analyse scientific data, including maps, charts and graphs, to draw conclusions and make informed decisions.
- Students will develop the ability to adapt to changes in the earth's systems and understand the dynamic nature of the planet.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Interior of the earth; Continental Drift Theory by Wegener; Plate tectonics; Folds and faults; Weathering and mass movement; Erosional and depositional landforms: Fluvial, glacial and aeolian.	3
2	Composition and structure of atmosphere; Insolation and heat budget; Temperature distribution, pressure belts, wind systems and precipitation types; Cyclones and anti-cyclones; Climate change.	
3	Distribution of temperature and salinity of ocean water; Ocean currents: Causes, types and their distribution over the Indian Ocean; Coral reefs and theories of reef formation after Darwin and Daly; Sea level change.	

Practical

Unit	Content	Hours/Week
1	Scale: Definition and types; Construction of linear, comparative and diagonal scale.	2
2	Map projection: Definition, classification, properties and uses; Mathematical/graphical construction of Polar Zenithal Gnomonic Projection, Simple Conical Projection with One Standard Parallel, Cylindrical Equal Area Projection.	

Suggested Reading

Ahmed, E. (1985). *Geomorphology*. Kalyani Publishers, New Delhi.

Khullar, D.R. (2012). *Physical Geography*. New Delhi, India: Kalyani Publishers.

Mohan, K. (2018). *GES PERIODOS VOL 1, An Ultimate Guide to Physical Geography*. OakBridge Publication, New Delhi.

Chorley, R.J., Schumm, S.A., & Sugden, D.E. (1984). *Geomorphology*. Methuen, London.

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

Thornbury, W.D. (2004). *Principles of Geomorphology*. New York, U.S.A.: Wiley.

Strahler, A.N. (1968). *The Earth Sciences*. Harper & Row Intl. Edn, New York.

Siddahartha, K. (2020). *Climatology, Atmosphere, Weather and Climate*. Kitaba Mahal Publication, New Delhi.

Lal, D.S. (1998). *Climatology*. Allahabad: Chaitanya Publishing House.

Singh, S. (2005). *Climatology*. Allahabad: Prayag Pustak Bhawan.

Barry, R.G., & Chorley, R.J. (2003). *Atmosphere, Weather and Climate*. Psychology Press, Hove; East Sussex.

Critchfield, H.J. (1975). *General Climatology*. Prentice Hall, New Jersey.

Garrison, T. (1998). *Oceanography*. Wordsworth Company, Belmont.

Kershaw, S. (2000). *Oceanography: An Earth Science Perspective*. Stanley Thornes, UK.

Sharma, R.C., & Vatal, M. (1980). *Oceanography for Geographers*. Chaitanya Publishing House, Allahabad.

Sverdrup, K.A., & Armbrust, E.V. (2008). *An Introduction to the World Ocean*. McGraw Hill, Boston.

Singh, R.L., & Singh, R.P.B. (1999). *Elements of Practical Geography*. Kalyani Publishers, New Delhi.

Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. Orient Black Swan Private Ltd., New Delhi.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 3

PAPER: MAJOR

Paper Description: GEOMORPHOLOGY

This paper provides an in-depth exploration of geomorphology, focusing on the field's nature, scope, and fundamental concepts. It covers a range of topics, including the concept of morphogenetic regions, topographical expressions in various geological structures, weathering processes and resulting landforms, mass wasting phenomena, and the theories behind slope development. Additionally, the course delves into the evolution of landforms through erosional and depositional processes, examining various landforms created by fluvial, karst, aeolian, glacial and coastal dynamics. The practical part will deal with understanding the fundamentals of topographic maps and their interpretation.

Paper Code: UGEOMAJ23003

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Nature and scope of geomorphology, including fundamental concepts in this field. This knowledge will allow the students to comprehend the processes and features shaping the Earth's surface.
- Landforms evolved through erosional and depositional processes in various environments, such as fluvial, karst, aeolian, glacial, and coastal. This knowledge will equip them to recognize and explain the formation of different landforms.
- Weathering processes, their controlling factors, types, and the resulting landforms. Additionally, the students will understand mass wasting, its definitions, the factors influencing it, and the different types. This knowledge will enable them to identify and analyze landforms resulting from weathering and mass wasting.

Skill Gained:

- Develop the skill to interpret physical and cultural features on topographical maps, particularly in plateau/mountain areas. This skill helps them analyze landscapes and recognize the spatial distribution of landforms.
- Master skills related to geospatial analysis by learning methods such as slope analysis (Wentworth), relative relief (Smith), and dissection index (Dov Nir). These skills will allow them to quantify and assess the terrain's characteristics and relief.

Competency Development:

- Gain competency to recognize and differentiate various landforms in different geomorphic settings. This skill is essential for geographers, and environmental professionals who need to understand and assess landscapes.
- Develop competency to analyze landscapes using tools like drainage density, drainage frequency, watershed delineation, Stream frequency and stream ordering. This analytical ability is crucial for studying natural processes and landform evolution.

- Acquire the competency to apply theories and concepts such as Davis', Penck's, and King's slope development theories to understand the morphogenetic processes that shape landscapes. This competency enhances their ability to explain the formation and evolution of landforms.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Nature and scope of geomorphology; Fundamental concepts in geomorphology; Concept of morphogenetic regions by Peltier; Classification of drainage and drainage patterns; Drainage development on folded and uniclinal structure.	3
2	Weathering: Definition, controlling factors, types and resulting landforms; Mass wasting: Definition, factors affecting mass wasting and types; Cycle of Erosion and Slope Development Theories (Davis, Penck and King).	
3	Evolution of landforms (erosional and depositional): Fluvial, aeolian, glacial, coastal and karst.	

Practical

Unit	Content	Hours/Week
1	Topographical Map: Interpretation of physical and cultural features of a topographical map (plateau/mountain area); Interpretation of topography/ landforms with the help of serial, superimposed, projected and composite profiles; Drawing of long and cross profile of a river.	2
2	Topographical Map: Average slope (Wentworth); Relative relief (Smith); Dissection index (Dov Nir); Ruggedness index (Schumann); Drainage density; Stream frequency; Watershed: Delineation and calculation of area using graph paper; Stream ordering (Strahler); Settlement frequency; Transect chart.	

Suggested Reading

Bloom, A. L. (2003). *Geomorphology: A Systematic Analysis of Late Cenozoic Landforms*. New Delhi: Prentice-Hall of India.

Bridges, E. M. (1990). *World Geomorphology*. Cambridge: Cambridge University Press.

Christopherson, R. W. (2011). *Geosystems: An Introduction to Physical Geography*, 8th ed. Macmillan Publishing Company.

Kale, V. S., & Gupta, A. (2001). *Introduction to Geomorphology*. Hyderabad: Orient Longman.

Knighton, A. D. (1984). *Fluvial Forms and Processes*. London: Edward Arnold Publishers.

Richards, K. S. (1982). *Rivers: Form and Processes in Alluvial Channels*. London: Methuen.

Selby, M. J. (2005). *Earth's Changing Surface*. Indian Edition. OUP.

Skinner, B. J., & Porter, S. C. (2000). *The Dynamic Earth: An Introduction to Physical Geology*, 4th Edition. John Wiley and Sons.

Thornbury, W. D. (1968). *Principles of Geomorphology*. Wiley.

Anson, R., & Ormelling, F. J. (1994). *International Cartographic Association: Basic Cartographic Vol.* Pregmen Press.

Gupta, K. K., & Tyagi, V. C. (1992). *Working with Map*. New Delhi: Survey of India, DST.

Mishra, R. P., & Ramesh, A. (1989). *Fundamentals of Cartography*. New Delhi: Concept.

Monkhouse, F. J., & Wilkinson, H. R. (1973). *Maps and Diagrams*. London: Methuen.

Rhind, D. W., & Taylor, D. R. F. (Eds.). (1989). *Cartography: Past, Present and Future*. Elsevier, International Cartographic Association.

Robinson, A. H. (2009). *Elements of Cartography*. New York: John Wiley and Sons.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. New Delhi: Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 3

PAPER: MAJOR

Paper Description: GEOGRAPHY OF RESOURCES

This course provides an in-depth understanding of the meaning and significance of resources, their creation and distribution, and the various factors influencing them, such as nature, human activities, and culture. Students will explore the classification of resources based on factors like exhaustibility, distribution, ownership, and development status, with a special focus on resources in India. Additionally, the course covers resource exploitation and degradation, emphasizing the importance of resource conservation from ecological, economic, and ethnological perspectives. Through the practical part, students will be able to megascopic identification of rocks and minerals and diagrammatic data presentation.

Paper Code: UGEOMAJ23004

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Concept of resources, their creation, and the factors influencing them. They will learn to classify resources based on various criteria, enabling them to appreciate the diverse nature of resources.
- Distribution of various resources in India, including forest, coal, iron ore, petroleum, atomic minerals, solar, wind and hydel power. They gain insights into the country's geographic and socio-economic factors influencing resource distribution.
- Resource conservation strategies, including those related to forests, soil, water, minerals, and energy resources. They will develop an understanding of ecological, economic, and ethnological approaches to resource management, recognizing the importance of sustainable practices.

Skill Gained:

- Develop practical skills in identifying a wide range of rocks and minerals, including Granite, Gneiss, Basalt, Limestone, Marble, Shale, Sandstone and more. This skill is essential for geology, environmental science, and resource management professionals.
- Enhance their data presentation and visualisation skills by using various diagrammatic techniques such as choropleth maps, chorochromatic maps, dot and sphere plots, and proportional cubes. These skills are crucial for effectively communicating resource-related information.

Competency Developed:

- Competent in assessing the availability and distribution of resources, particularly in the context of India. They can analyze the factors influencing resource availability and propose strategies for resource management.
- Advocate for resource conservation, capable of applying ecological, economic, and ethnological approaches to real-world resource management challenges. They are well-equipped to contribute to sustainable resource use and environmental protection.
- Develop proficiency in data analysis and communication through diagrammatic representations. They can effectively present resource-related data to diverse audiences, aiding informed decision-making and policy development.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Resource: Nature and definition; Resource-creating factors: Nature, man and culture; Functional and dynamic concept of resources; Classification of resources based on exhaustibility, distribution, ownership and status of development.	3
2	Distribution of resources with special reference to India: Forest, coal, iron ore, petroleum, atomic minerals, solar, wind and hydel power.	
3	Concept of resource exploitation and degradation; Resource conservation: Forest, soil, water, mineral and energy; Ecological, economic and ethnological approach to resource management.	

Practical

Unit	Content	Hours/Week
1	Megascopic identification of rocks and minerals: Granite, Gneiss, Basalt, Limestone, Marble, Shale, Sandstone, Conglomerate, Bauxite, Slate, Quartzite, Schist, Phyllite, Calcite, Chalcopyrite, Feldspar, Galena, Haematite, Magnetite, Mica, Quartz, Tourmaline, and Talc.	2
2	Diagrammatic data presentation: Chorochromatic map, dot and sphere map, choropleth map, diagrammatic map (proportional square and cubes).	

Suggested Reading

Blanco, E., & 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, G.C. (1995). *Certificate Physical and Human Geography*. Oxford Univ., Press, Oxford.

Coe, N., Kelly, P., & 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., & 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, P. (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.

Gadgil, M., & Guha, R. (2005). *The Use and Abuse of Nature: Incorporating This Fissured Land: An Ecological History of India and Ecology and Equity*. Oxford University Press, USA.

Holechek, J.L.C., Fisher, R.A., & Valdez, J.T. (2003). *Natural Resources: Ecology, Economics and Policy*. Prentice Hall, New Jersey.

Mather, A.S., & Chapman, K. (1995). *Environmental Resources*. John Wiley and Sons, New York.

Mitchell, B. (1997). *Resource and Environmental Management*. Longman Harlow, England.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 3

PAPER: MAJOR

Paper Description: POPULATION GEOGRAPHY

This course provides students with a comprehensive understanding of population dynamics, demographic theories, and the practical skills required for data analysis. It equips students with the knowledge and tools to explore and interpret demographic trends and patterns, making it a valuable asset for anyone interested in the field of geography, demography or data analysis.

Paper Code: UGEOMAJ23005

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Fundamental concepts of population geography, including the nature and scope of the field, sources of population data, and the various types of population density. They will also learn about the factors contributing to population growth and distribution globally and in India's context.
- Pivotal theories of population growth – the Malthusian theory and the demographic transition Model. Students will understand deeply how these theories have shaped our understanding of population dynamics and their implications for society.
- Composition of the Indian population, with a focus on rural-urban divides, age, gender, and literacy. They will also gain insights into the concepts of ageing populations and demographic dividends. They will also gain knowledge about the concept, types, causes and consequences of Migration. Furthermore, they will learn about important policies like the National Population Policy of 2000 in India.

Skill Gained:

- Develop essential data analysis skills using Microsoft Excel. They will also learn to navigate the Excel interface, perform data entry, editing, and formatting, work with various data types and gain proficiency in sorting, filtering, and creating tables for efficient data organization.
- Equip students with the ability to create a wide range of charts, including column, bar, line, pie, and scatter plots. They will learn to customize chart elements like titles, legends, and labels, making data visualization a powerful tool for conveying demographic trends and insights.

Competency Developed:

- Acquire the competency to project population figures using various methods such as arithmetical increase, geometrical progression, and incremental increase. This skill is crucial for making informed demographic predictions.
- Through constructing and interpreting age-sex pyramids, students will become proficient in analyzing demographic data visually, enabling them to draw meaningful conclusions about population structures.
- Enhance students' data analysis and interpretation competency, a valuable skill applicable across various disciplines. They can also apply these skills to real-world situations, including assessing migration trends and understanding the implications of fertility and mortality measures.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Nature and scope of population geography and its relation to demography; Sources of population data and its relevance (India); Density of population: Meaning and types (arithmetic density, physiological density, nutritional density, habitational density, agricultural density and man-land ratio); Population pyramid; The concept of over-population, under-population, optimum population, population explosion.	3
2	Population growth and distribution: Determinants and patterns (world and India); Theories of population growth: Malthusian Theory and Demographic Transition Model; Concept of ageing population and demographic dividend.	
3	Population composition of the world (religion and language); Age-cohort; Population dynamics: Fertility and mortality (measures and determinants); Fecundity and morbidity; Migration: Types, causes and consequences; Laws of migration (Ravenstein, Lee and Todaro); Population-resource regions (Ackerman); National Population Policy (2000) India.	

Practical

Unit	Content	Hours/Week
1	Population projection: Arithmetical increase method, geometrical progression method and incremental increase method; Measures of fertility (crude birth rate, general fertility rate, age-specific fertility rate and total fertility rate); Measures of mortality (crude death rate, age-specific death rate and infant mortality rate); Construction and interpretation of age-sex pyramids; Flow diagram showing migration trends.	2
2	Basic computer skills (data representation with MS Excel): Overview of Excel interface and functionalities; Basic knowledge of workbook, worksheet, cell and range; Data entry, data editing, data formatting and data types (numbers, dates, text); Sorting and filtering of data; Formulas and functions for data manipulation; Construction of tables for data organization; Creating different types of charts (column, bar, line, pie and scatter); Customizing chart elements (titles, legends and labels); Creating pivot tables and analyzing data.	

Suggested Reading

Barrett, H. R. (1995). *Population Geography*. Oliver and Boyd.

Bhende, A., & Kanitkar, T. (2000). *Principles of Population Studies*. Himalaya Publishing House.

Chandna, R. C., & Sidhu, M. S. (1980). *An Introduction to Population Geography*. Kalyani Publishers.

Clarke, J. I. (1965). *Population Geography*. Pergamon Press, Oxford.

Jones, H. R. (2000). *Population Geography*, 3rd ed. Paul Chapman, London.

Lutz, W., Warren, C. S., & Scherbov, S. (2004). *The End of the World Population Growth in the 21st Century*. Earthscan.

Newbold, K. B. (2009). *Population Geography: Tools and Issues*. Rowman and Littlefield Publishers.

Pacione, M. (1986). *Population Geography: Progress and Prospect*. Taylor and Francis.

Wilson, M. G. A. (1968). *Population Geography*. Nelson.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Das, N.G. (2009). *Statistical Methods*. McGraw Hill Education (India) Private Limited.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 3

Paper: SEC

Paper Description: ENVIRONMENTAL GEOGRAPHY

The paper provides students with a comprehensive understanding of environmental studies, covering various aspects of the environment, environmental pollution, management, laws, and ethics. Additionally, it includes a practical component where students engage in a project related to environmental issues.

Paper Code: UGEOSEC23003

Paper Type: Theory + Practical Lab Based-PLB

Credit: 2 credit theory and 1 credit practical.

Class Hours: 2 theory classes per week and 2 practical classes per week. Total 4 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- A solid foundation in environmental concepts, including the definition and components of the environment. They will understand the sources, effects, and remedies of environmental pollution in air, water, soil, and noise.
- Agricultural development, industrial development, and urbanization contribute to environmental degradation. They will analyze the impact of these factors on the environment.
- Environmental laws and policies in India, such as the Wildlife Protection Act, Water (Prevention and Control of Pollution) Act, Forest Conservation Act, and Environmental Protection Act. They will understand the importance of these legal frameworks in environmental conservation.

Skill Gained:

- Through the practical project, students will develop research skills as they gather and analyze secondary data on environmental topics. They will also enhance their report-writing skills, which are crucial for effective communication in the field of environmental studies.
- The study of environmental ethics and the analysis of environmental movements will encourage critical thinking and ethical reflection among students. They will learn to evaluate the ethical dimensions of environmental issues and movements.

Competency Developed:

- Acquire a heightened awareness of environmental issues and their consequences. They will be able to identify sources of pollution and propose potential remedies.
- Understanding the significance of Environmental Impact Assessment and the management of solid wastes will equip students with the knowledge and skills required for effective environmental planning and management.
- Familiarity with environmental laws and policies will enable students to appreciate the importance of legal compliance in environmental protection. They will understand how these regulations contribute to sustainable development and conservation.

Syllabus Overview

Theory

Unit	Content	Hours/Week

1	Definition and component of environment; Environmental pollution (air, water and noise): Sources, effects and remedies; Environmental degradation due to agricultural development, industrial development and urbanization; Solid wastes: Types, sources and their management.	2
2	Environmental planning and management: Meaning, importance and needs of Environmental Impact Assessment; Environmental ethics; Environmental movements in India: Chipko and Narmada Bachao Andolan; Environmental laws and policies in India: Water (Prevention and Control of Pollution) Act: 1974, Forest Conservation Act: 1980, Air (Prevention and Control of Pollution) Act: 1981, Environmental Protection Act: 1986, Noise Pollution (Regulation and Control) Rules: 2000, Municipal Solid Waste (Management and Handling) Rules: 2000.	

Practical

Unit	Content	Hours/Week
1	A project report will be prepared by the students in consultation with their respective college teachers on any issues or topics related to environment. The report will be prepared based on available sources of secondary data only. Report should be limited within 20-25 pages, handwritten and may include maps, diagrams, charts and tables. The report will be examined externally and marks will be separately allotted for report and viva-voce taken individually. Students will be divided into groups so that in each college at least 4 groups are formed and each group will prepare their report taking different topics under the supervision of the faculty members.	2

Suggested Reading

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

Cunninghum, W. P., & Cunninghum, M. A. (2004). *Principals of Environmental Science: Inquiry and Applications*. New Delhi: Tata Macgraw Hill.

Goudie, A. (2001). *The Nature of the Environment*. Oxford: Blackwell.

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

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

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

Singh, R.B., & Hietala, R. (Eds.) (2014). *Livelihood Security in Northwestern Himalaya: Case Studies from Changing Socio-economic Environments in Himachal Pradesh, India*. Advances in Geographical and Environmental Studies. Springer.

Odum, E. P., et al. (2005). *Fundamentals of Ecology*. Ceneage Learning India.

Singh, S. (1997). *Environmental Geography*. Allahabad: Prayag Pustak Bhawan.

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

Singh, M., Singh, R.B., & Hassan, M.I. (Eds.) (2014). *Climate Change and Biodiversity: Proceedings of IGU Rohtak Conference, Volume 1*. Advances in Geographical and Environmental Studies. Springer.

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

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Practical guidelines: Although the work on the project report will be done in groups, the students will have to carry their individual copies duly signed by their supervising teacher at the time of viva-voce.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: Project Report	5: Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 3

PAPER: MINOR

Paper Description: HUMAN GEOGRAPHY

This paper delves into the fundamental aspects of human geography with a specific focus on India. It comprehensively explores the nature, scope, and branches of human geography, shedding light on the theories that have shaped our understanding of population growth and urban development. Through practical exercises, it equips students with the skills to interpret topographical maps and present data diagrammatically.

Paper Code: UGEOMIN20002

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Theories such as environmental determinism, possibilism, neo-determinism, and the quantitative revolution. They understand how these theories have contributed to the study of human geography.
- In-depth knowledge of population growth theories, including the Malthusian and demographic transition theories. They also understand the intricacies of population composition, fertility, mortality, and migration patterns in the Indian context.
- Urban settlement classifications, theories like the Central Place Theory, and the evolving patterns of urbanization in India. They develop a nuanced understanding of the dynamics shaping urban areas.

Skills Gained:

- Develop the ability to interpret topographical maps, identify physical and cultural features, and analyze landforms, slopes, and drainage patterns. This skill enhances their spatial analysis capabilities.
- Acquire proficiency in effectively conveying geographic information Through diagrammatic data presentation techniques, such as line, bar, circle, dot, and choropleth maps. They learn how to choose appropriate visualizations for different types of data.

Competency Developed:

- Become adept at critically analyzing geographic phenomena and understanding the underlying factors driving population growth, settlement patterns, and urbanization. They can evaluate the strengths and limitations of various theories.
- The practical exercises equip students with the competence to collect, interpret, and present geographical data, enhancing their ability to conduct research and contribute to the field.
- By focusing on India, students gain a contextual understanding of human geography, enabling them to apply their knowledge and skills to real-world issues related to population, settlement, and urban development within the country.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Nature, scope and branches of human geography; Concept of determinism and possiblism; Neo-determinism; Systematic and regional geography.	3
2	Growth and distribution of population in India; Theories of population growth: Malthusian Theory and Demographic Transition Model; Population Composition (India): Rural-urban and age-sex; Migration: Types, causes and consequences.	
3	Factors affecting the growth of the rural settlements; Types and patterns of rural settlements; Urban landuse and morphology: Concentric Zone Theory, Sector Theory and Multiple Nuclei Theory; Trends and patterns of urbanization in India.	

Practical

Unit	Content	Hours/Week
1	Topographical map: Interpretation of physical and cultural features of a topographical map (plateau/mountain area); Interpretation of topography/ landforms with the help of serial, superimposed, projected and composite profiles; Relative relief map (Smith); Transect chart: : Drawing and interpretation.	2
2	Diagrammatic data presentation: Line graph, bar graph (simple, compound and multiple), proportional circle and choropleth map.	

Suggested Reading

Chandna, R.C. (2010). *Population Geography*. Kalyani Publisher.

Hassan, M.I. (2005). *Population Geography*. Jaipur: Rawat Publications.

Daniel, P.A., & Hopkinson, M.F. (1989). *The Geography of Settlement*. London: Oliver & Boyd.

Johnston, R., Gregory, D., Pratt, G., et al. (2008). *The Dictionary of Human Geography*. Blackwell Publication.

Jordan-Bychkov, T., et al. (2006). *The Human Mosaic: A Thematic Introduction to Cultural Geography*. New York: W. H. Freeman and Company.

Cuff, J.D., & Mattson, M.T. (1982). *Thematic Maps: Their Design and Production*. Methuen Young Books.

Dent, B.D., Torguson, J.S., & Holder, T.W. (2008). *Cartography: Thematic Map Design* (6th Edition). Mcgraw-Hill Higher Education.

Gupta, K.K., & Tyagi, V.C. (1992). *Working with Maps*. New Delhi: Survey of India, DST.

Kraak, M.-J., & Ormeling, F. (2003). *Cartography: Visualization of Geo-Spatial Data*. Prentice-Hall.

Mishra, R.P., & Ramesh, A. (1989). *Fundamentals of Cartography*. New Delhi: Concept.

Singh, R.L., & Singh, R.P.B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Slocum, T.A., McMaster, R.B., & Kessler, F.C. (2008). *Thematic Cartography and Geo-visualization* (3rd Edition). Prentice Hall.

Tyner, J.A. (2010). *Principles of Map Design*. The Guilford Press.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Das, N.G. (2009). *Statistical Methods*. McGraw Hill Education (India) Private Limited.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of the practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 4

PAPER: MAJOR

Paper Description: CLIMATOLOGY

The paper provides a comprehensive overview of key concepts in climatology, focusing on the fundamental theories and principles that govern weather and climate patterns. It covers a wide range of topics related to the Earth's atmosphere, including its composition and structure, heat budget, temperature distribution, atmospheric pressure, wind patterns, precipitation formation, weather phenomena, climate classifications, and the critical issues of climate change, ozone depletion, and acid precipitation. This paper aims to provide a foundational understanding of climatology and its real-world applications, making it a valuable resource for students and professionals in the fields of environmental science, meteorology, and related disciplines. The practical part will cover meteorological instruments, interpretation of Indian daily weather reports, Climograph and Hythergraph.

Paper Code: UGEOMAJ24006

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Earth's climate systems, including the factors that influence climate and weather patterns. This includes insights into the composition of the atmosphere, heat transfer mechanisms, and the intricate interactions that drive global atmospheric circulation.
- Predominant theories governing cloud and precipitation formation: The Bergeron-Findeisen and Collision-Coalescence theories. It will allow them to comprehend the complex processes that underlie weather phenomena and precipitation types.
- Koppen and Thornthwaite climatic classification. Additionally, they will acquire knowledge about pressing contemporary issues, such as climate change, ozone depletion, and acid precipitation, deepening our awareness of environmental challenges.

Skills Gained:

- By studying the atmosphere's composition and structure, heat budgets, and circulation patterns, students will develop the ability to analyze complex environmental data and draw conclusions about climate dynamics.
- Learn about climate theories and their practical applications will enhance student's research skills and their capacity to interpret meteorological data, which is essential for understanding and addressing climate-related issues. The interpretation of daily weather reports, both for summer and winter conditions, hones the ability to analyze and make sense of complex meteorological data.
- Through hands-on experience with meteorological instruments like the Max and Min Thermometer, Hygrometer, and Fortin's Barometer, students will develop essential skills in data collection and instrument operation.
- Usage of Climographs and Hythergraphs, shall enable students to present climatic data graphically, enhancing their ability to communicate complex information effectively.

Competencies Developed:

- Acquiring knowledge of climate patterns, wind circulation, and atmospheric processes will equip the students with the competency to adapt to different climate conditions and make informed decisions in various contexts, from agriculture to urban planning.
- Understanding climate change, ozone depletion, and acid precipitation fosters a sense of responsibility for the environment. They become better equipped to engage in discussions and actions that promote environmental sustainability and conservation.
- The paper's insights into atmospheric stability, precipitation, and cyclones shall enable the students to better understand and predict weather events, which is crucial for disaster preparedness and mitigation efforts in regions vulnerable to extreme weather conditions.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Weather and climate; Composition and structure of the atmosphere; Insolation and heat budget; Latitudinal heat balance; Mechanism of energy/ heat transfer; Distribution of temperature: Horizontal and vertical; Inversion of temperature.	3
2	Vertical and horizontal distribution of atmospheric pressure and pressure belts; Factors affecting wind direction and speed; Global wind belts and general circulation; Local wind; Geostrophic wind; Jet stream; El Nino and La Nina.	
3	Humidity: Types and measurement; Atmospheric stability and instability; Condensation and nucleation; Mechanism of precipitation: Bergeron-Findeisen and Collision-Coalescence Theory; Precipitation types; Airmass and fronts; Thunderstorms; Cyclone and anti-cyclone; Classification of world climate: Koppen & Thornthwaite; Climate change: Evidence and causes, ozone depletion and acid rain.	

Practical

Unit	Content	Hours/Week
1	Meteorological instruments: Maximum and Minimum Thermometer, Hygrometer, Fortin's Barometer.	2
2	Interpretation of Indian daily weather report ((hot weather season, southwest monsoon season, northeast monsoon season and winter season); Representation of weather/ climate data: Climograph (Taylor) and Hythergraph (Taylor).	

Suggested Reading

Barry, R. G., & Carleton, A. M. (2001). *Synoptic and Dynamic Climatology*. Routledge, UK.

Barry, R. G., & Corley, R. J. (1998). *Atmosphere, Weather and Climate*. Routledge, New York.

Critchfield, H. J. (1987). *General Climatology*. New Delhi: Prentice-Hall of India.

Lutgens, F. K., Tarbuck, E. J., & Tasa, D. (2009). *The Atmosphere: An Introduction to Meteorology*. Englewood Cliffs, New Jersey: Prentice-Hall.

Oliver, J. E., & Hidore, J. J. (2002). *Climatology: An Atmospheric Science*. New Delhi: Pearson Education.

Trewartha, G. T., & Horne, L. H. (1980). *An Introduction to Climate*. McGraw-Hill.

Lal, D. S. (1998). *Climatology*. Allahabad: Chaitanya Publishing House.

Singh, S. (2005). *Climatology*. Allahabad: Prayag Pustak Bhawan.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 4

PAPER: MAJOR

Paper Description: GEOGRAPHY OF INDIA

This paper aims to cover a wide range of topics related to the physical, social, and economic aspects of geography and regional development in India. Overall, the paper provides a comprehensive understanding of the country's physical, environmental, social, and economic aspects, preparing students for careers in geography, regional planning, environmental assessment, and related fields. The students will prepare a field report in the practical part of the course, where students will work on a project report related to this paper.

Paper Code: UGEOMAJ24007

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Physical geography of India, including its location, physiographic divisions, drainage patterns, soil types, and natural vegetation.
- Salient features of India's climate and the Indian Monsoon system, including its origin, characteristics, and mechanisms.
- Distribution of the population in terms of caste, religion, language, and occupation, as well as an understanding of the salient features of Indian agriculture, the production and distribution of major crops and Agro-climatic regions as per the Planning Commission of India.

Skills Gained:

- Develop the ability to analyze geographical and climatic data to understand patterns and trends.
- The study of population distribution, including caste, religion, and language, will develop students' cultural and societal awareness.
- Analyze major crop production and agro-climatic regions will enhance students' economic and agricultural analysis skills.

Competency Developed:

- Assess the impact of climatic phenomena like the Indian Monsoon and El Nino on various aspects of life, including agriculture and society.
- The study of the spatial pattern of industrial development and transport networks will equip students with the competency to understand and contribute to regional development and planning initiatives.
- The practical unit involving field reports will enhance students' ability to conduct field research, collect data, and communicate their findings effectively, which is a valuable skill for geography professionals.

Syllabus Overview

Theory

Unit	Content	Hours/Week

1	Location and physiographic divisions; Drainage, soil and natural vegetation; Seasonal features of Indian climate; Indian monsoon: Origin, characteristics and mechanism; El Nino, La Nina and Indian monsoon; Climatic regions: Stamp and Trewartha.	3
2	Growth of population; Distribution of population (density, religion, language and tribes); Population composition: Rural-urban, gender and literacy; Salient features of Indian agriculture; Production and distribution of major crops: Rice, wheat, cotton and tea; Agro-climatic regions (Planning Commission of India).	
3	Spatial pattern of industrial development: Iron and steel, cotton textile, petro-chemical, automobile and information technology; Nature, pattern and development of transport network: Railways, roadways and waterways.	

Practical

Unit	Content	Hours/Week
1	A field report will be prepared by the students in consultation with their respective college teachers on any topic related to human geography. The report will be prepared based on primary and secondary data collected during field visits, which is compulsory. The report should be limited to 50-60 pages, handwritten and may include maps, diagrams, charts and tables. The report will be examined externally, and marks will be separately allotted for the report and viva-voce taken individually.	2

Suggested Reading

Deshpande, C. D. (1992). *India: A Regional Interpretation*. ICSSR, New Delhi.

Johnson, B. L. C. (Ed.). (2001). *Geographical Dictionary of India*. Vision Books, New Delhi.

Mandal, R. B. (Ed.). (1990). *Patterns of Regional Geography – An International Perspective. 16 Vol. 3 – Indian Perspective.*

Sdyasuk, Galina, & Sengupta, P. (1967). *Economic Regionalization of India, Census of India.*

Sharma, T. C. (2003). *India - Economic and Commercial Geography*. New Delhi: Vikas Publ.

Singh, R. L. (1971). *India: A Regional Geography*. National Geographical Society of India.

Singh, Jagdish. (2003). *India; A Comprehensive & Systematic Geography*. Gorakhpur: Gyanodaya Prakashan.

Spate, O. H. K., & Learmonth, A. T. A. (1967). *India and Pakistan: A General and Regional Geography*. Methuen.

Tirtha, Ranjit. (2002). *Geography of India*. Jaipur & New Delhi: Rawat Publishers.

Pathak, C. R. (2003). *Spatial Structure and Processes of Development in India*. Kolkata: Regional Science Assoc.

Tiwari, R.C. (2007). *Geography of India*. Allahabad: Prayag Pustak Bhawan.

Sharma, T.C. (2013). *Economic Geography of India*. Jaipur: Rawat Publication.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Practical guidelines: Although the work on the field report will be done in groups, the students will have to carry their individual copies duly signed by their supervising teacher at the time of viva-voce.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: Field Report	5: Viva-voce.		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 4

PAPER: MAJOR

Paper Description: GEOGRAPHICAL INFORMATION SYSTEM

The paper on GIS (Geographic Information Systems) provides a comprehensive overview of this powerful technology that integrates spatial data and attribute information to support decision-making and problem-solving across various domains. It covers the fundamentals of GIS, data types, applications, and practical skills for working with GIS software. The practical part will increase the efficiency among students by covering geo-referencing of scanned topographical sheets and maps, digitizing, exploring and managing raster data, creating and managing vector data, thematic mapping, creating thematic maps all using QGIS 3.22.

Paper Code: UGEOMAJ24008

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- A solid foundation in GIS, including the definition and evolution of GIS, components, and the distinction between digital and analogue maps.
- In GIS applications, Spatial and attribute data, raster and vector data models, and database management systems (DBMS).
- A wide range of GIS applications, such as urban planning, environmental management, health care systems, and defence, enable students to comprehend the versatility and significance of GIS technology.

Skills Gained:

- Acquire practical skills in handling spatial data, including geo-referencing topo sheets, digitizing point, line, and polygon features, and working with raster and vector data.
- Enable the students to work with GIS software i.e. QGIS, teaching them how to add, format, and export vector and raster layers and create thematic maps.
- Develop data management and analysis competencies by exploring raster styling and mosaicking, attribute data manipulation, and importing external data sources.

Competency Developed:

- Develop competency to address real-world challenges by applying GIS technology to various domains, translating theoretical knowledge into practical solutions.
- Proficiency in managing and analyzing spatial and attribute data, ensuring data quality, and minimizing errors in GIS projects.
- Cultivate the ability to think spatially and make informed decisions using GIS tools, which is invaluable for a wide range of professional and research applications.

Syllabus Overview:

Theory

Unit	Content	Hours/Week
1	Nature, definitions and evolution of GIS; Components of GIS; Functional requirements of GIS; Advantages and limitations of GIS; Coordinate system and map projection in GIS.	3
2	GIS data types: Spatial and attribute data; Database models: Raster and vector; File formats of spatial data; Concept, functions, components and advantages of DBMS; Elements of data quality; Sources of error in GIS, Concept of Web-GIS.	
3	Application of GIS: Urban planning, environmental management, agriculture, disaster management, health care system, transport planning, defense and military, decentralized planning, tourism and natural resource management.	

Practical

Unit	Content	Hours/Week
1	Geo-referencing of scanned topographical sheets and maps; Digitizing using point, line and polygon features; Exploring and managing raster data: Adding raster layers, raster styling and analysis, raster mosaicking and clipping; Creating and managing vector data: Adding vector layers, setting properties, merging, formatting and exporting of data (all using QGIS 3.22).	2
2	Thematic mapping; Working with attribute data; Importing spreadsheets or CSV files using plug-in tools; Creating thematic maps (all using QGIS 3.22).	

Suggested Reading

Heywood, I. (2011). *An Introduction to Geographical Information Systems*.

Aronoff, S. (1989). *Geographic Information Systems: A Management Perspective*.

Elangovan, K. (2006). *GIS - Fundamentals, Applications, and Implementations*.

Chang, K. T. (2015). *Introduction to Geographical Information Systems*.

Bhatta, B. (2011). *Remote Sensing and GIS*.

Sharma, H. S. (2006). *Mathematical Modelling in Geographical Information System, Global Positioning System and Digital Cartography*.

Ghosh, A., & Rushton, G. (1987). *Spatial Analysis and Location-Allocation Models*.

Tomlin, C. D. (1990). *Geographic Information Systems and Cartographic Modelling*.

Longley, P. A., et al. (2015). *Geographic Information Systems and Science*.

Clarke, C. K. (2002). *Geographic Information Systems and Environmental Modelling*.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 4

PAPER: MINOR

Paper Description: HUMAN GEOGRAPHY

This paper delves into the fundamental aspects of human geography with a specific focus on India. It comprehensively explores the nature, scope, and branches of human geography, shedding light on the theories that have shaped our understanding of population growth and urban development. Through practical exercises, it equips students with the skills to interpret topographical maps and present data diagrammatically.

Paper Code: UGEOMIN20002

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Theories such as environmental determinism, possibilism, neo-determinism, and the quantitative revolution. They understand how these theories have contributed to the study of human geography.
- In-depth knowledge of population growth theories, including the Malthusian and demographic transition theories. They also understand the intricacies of population composition, fertility, mortality, and migration patterns in the Indian context.
- Urban settlement classifications, theories like the Central Place Theory, and the evolving patterns of urbanization in India. They develop a nuanced understanding of the dynamics shaping urban areas.

Skills Gained:

- Develop the ability to interpret topographical maps, identify physical and cultural features, and analyze landforms, slopes, and drainage patterns. This skill enhances their spatial analysis capabilities.
- Acquire proficiency in effectively conveying geographic information Through diagrammatic data presentation techniques, such as line, bar, circle, dot, and choropleth maps. They learn how to choose appropriate visualizations for different types of data.

Competency Developed:

- Become adept at critically analyzing geographic phenomena and understanding the underlying factors driving population growth, settlement patterns, and urbanization. They can evaluate the strengths and limitations of various theories.
- The practical exercises equip students with the competence to collect, interpret, and present geographical data, enhancing their ability to conduct research and contribute to the field.
- By focusing on India, students gain a contextual understanding of human geography, enabling them to apply their knowledge and skills to real-world issues related to population, settlement, and urban development within the country.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Nature, scope and branches of human geography; Concept of determinism and possiblism; Neo-determinism; Systematic and regional geography.	3
2	Growth and distribution of population in India; Theories of population growth: Malthusian Theory and Demographic Transition Model; Population Composition (India): Rural-urban and age-sex; Migration: Types, causes and consequences.	
3	Factors affecting the growth of the rural settlements; Types and patterns of rural settlements; Urban landuse and morphology: Concentric Zone Theory, Sector Theory and Multiple Nuclei Theory; Trends and patterns of urbanization in India.	

Practical

Unit	Content	Hours/Week
1	Topographical map: Interpretation of physical and cultural features of a topographical map (plateau/mountain area); Interpretation of topography/ landforms with the help of serial, superimposed, projected and composite profiles; Relative relief map (Smith); Transect chart: : Drawing and interpretation.	2
2	Diagrammatic data presentation: Line graph, bar graph (simple, compound and multiple), proportional circle and choropleth map.	

Suggested Reading

Chandna, R.C. (2010). *Population Geography*. Kalyani Publisher.

Hassan, M.I. (2005). *Population Geography*. Jaipur: Rawat Publications.

Daniel, P.A., & Hopkinson, M.F. (1989). *The Geography of Settlement*. London: Oliver & Boyd.

Johnston, R., Gregory, D., Pratt, G., et al. (2008). *The Dictionary of Human Geography*. Blackwell Publication.

Jordan-Bychkov, T., et al. (2006). *The Human Mosaic: A Thematic Introduction to Cultural Geography*. New York: W. H. Freeman and Company.

Cuff, J.D., & Mattson, M.T. (1982). *Thematic Maps: Their Design and Production*. Methuen Young Books.

Dent, B.D., Torguson, J.S., & Holder, T.W. (2008). *Cartography: Thematic Map Design* (6th Edition). Mcgraw-Hill Higher Education.

Gupta, K.K., & Tyagi, V.C. (1992). *Working with Maps*. New Delhi: Survey of India, DST.

Kraak, M.-J., & Ormeling, F. (2003). *Cartography: Visualization of Geo-Spatial Data*. Prentice-Hall.

Mishra, R.P., & Ramesh, A. (1989). *Fundamentals of Cartography*. New Delhi: Concept.

Singh, R.L., & Singh, R.P.B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Slocum, T.A., McMaster, R.B., & Kessler, F.C. (2008). *Thematic Cartography and Geo-visualization* (3rd Edition). Prentice Hall.

Tyner, J.A. (2010). *Principles of Map Design*. The Guilford Press.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Das, N.G. (2009). *Statistical Methods*. McGraw Hill Education (India) Private Limited.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of the practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 5

PAPER: MAJOR

Paper Description: SOIL GEOGRAPHY

This paper provides valuable insights into the relations between soils, landscapes, and human societies, contributing to informed decision-making and effective land use planning for sustainable development. It explores nature and scope, definition, factors and processes of forming soil, development and characteristics of an ideal soil profile, profiles development of laterite, Podzol, and Chernozem soil, physical and chemical properties of soil, soil colloid, and soil classification. Practical exercises provide the skills to determine soil type through ternary diagrams, textural plotting, Ergographs, and diagrammatic data presentation.

Paper Code: UGEOMAJ35009

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Concept of soil, an ideal soil profile and profile development of Laterite, Podzol and Chernozem soil.
- Physical and Chemical properties of soil and soil colloid.
- Dokuchaev's genetic classification, Marbut's morphogenetic classification, USDA classification of soil taxonomy and classification of Indian soil according to ICAR.

Skills Gained:

- Develop skills in determining soil type by Ternary Diagram textural plotting.
- Construction of Ergograph.
- Interpreting Geological Map drawings of geological sections on uniclinal and folded structures.

Competency Developed:

- Develop the ability to question, reason, and draw logical conclusions based on concepts, various theories, and classifications related to soil.
- Making students efficient in determining soil type to construct Ergograph.
- Enable students to interpret the Geological Map effectively.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Nature and scope of soil geography; Soil: Definition, factors and processes of formation; Concept of pedon, eluviation and illuviation; Development and characteristics of an ideal soil profile; Profile development of laterite, podzol and chernozem soil.	3
2	Physical properties of soil: Texture, structure, moisture, colour and temperature; Chemical properties of soil: pH, organic matter, cation	

	exchange capacity and plant nutrients; Soil colloid: Types, characteristics and influence on soil fertility.	
3	Soil classification: Genetic classification (Dokuchaev), morphogenetic classification (Marbut), USDA classification of soil taxonomy; Classification of Indian soils (ICAR).	

Practical

Unit	Content	Hours/Week
1	Identification of soil type by textural plotting (Ternary Diagram); Ergograph.	2
2	Geological Map interpretation: Drawing of geological sections on uniclinal and folded structures (simple series and multiple series formation).	

Suggested Reading

Daji, J.A., Kadam, J.R., & Patil, N.D. (1996). *A Textbook of Soil Science*. Media Promoters and Publishers.

Dey, N. K., & Ghosh, P. (1993). *India: A Study in Soil Geography*. Sribhumi Publishing Company.

Singer, M., & Munns, D.N. (2005). *Soils: An Introduction* (6th ed.). Pearson.

Weil, R.R., & Brady, N.C. (2016). *The Nature and Properties of Soil* (15th ed.). Pearson.

White, R. (2006). *Principles and Practice of Soil Science: The Soil as a Natural Resource*. Blackwell.

Biswas, T.D., & Mukherjee, S.K. (1997). *Textbook of Soil Science*. Tata McGraw Hill.

Morgan, R.P.C. (1995). *Soil Erosion and Conservation* (2nd ed.). Longman, London.

USDA: United States Department of Agriculture. (2014). *Soil Survey and Laboratory Methods Manual*, Soil Survey Investigations Report No. 51.

Xiao, M. (2009). *Soil Testing Laboratory Manual*. Bent Tree Press.

Singh, R.L., & Singh, R.P.B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Mishra, R.P., & Ramesh, A. (1989). *Fundamentals of Cartography*. Concept, New Delhi.

Das, N.G. (2009). *Statistical Methods*. McGraw Hill Education (India) Private Limited.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 5

PAPER: MAJOR

Paper Description: RURAL DEVELOPMENT

This paper provides the concept of rural development and its significance in fostering sustainable livelihoods, alleviating poverty, and achieving equitable growth. The topics included in the theoretical part are the concept of rural development, the need for rural development, the Gandhian model of rural development, the Panchayati Raj system, the Big Push theory, the Lewis economic development model, Myrdal's spread and backwash effects theory, rural poverty, concept and importance of the non-farm sector in rural development, approaches to rural development and major rural development programs. The topics included in the practical part are organizing data, measures of central tendency, measures of dispersion, coefficient of variation and measures of inequality.

Paper Code: UGEOMAJ35010

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Concept of rural development, Gandhian rural development model and governance.
- Big Push Theory, the Lewis model of economic development, and Myrdal's Theory of Spread and Backwash Effects.
- Concept of Rural poverty and non-farm sector in rural development.
- Major rural development programmes include SGSY, MGNREGA, PMJDY, PMJAY, PMGSY, PURA, PMAY, and SBM.

Skills Gained:

- Develop skills in organizing data.
- Skills Gained in statistics include measures of central tendency, measures of dispersion and coefficient of variation, measures of inequality include the Lorenz curve and Gini's co-efficient.

Competency Developed:

- Develop a proper understanding regarding rural development and rural Governance among students.
- Cultivate skills in students regarding paradigms of rural development, rural poverty and importance of non-farm sector in rural development.
- Make student aware of major Indian rural development programmes.
- Enable students to interpret and visually communicate data using statistics.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Rural development: Concept, elements and need; Gandhian Model of Rural Development; Rural Governance: Panchayati Raj System.	3
2	Paradigms of rural development: Big Push Theory, Lewis Model of Economic Development, Myrdal's theory of Spread and Backwash	

	Effects. Rural poverty: Causes and consequences; Concept and importance of non-farm sector in rural development.	
3	Approaches to rural development; Major rural development programmes in India: SGSY, MGNREGA, PMJDY, PMJAY, PMGSY, PURA, PMAY and SBM.	

Practical

Unit	Content	Hours/Week
1	Organizing data: Frequency distribution tables, histograms, frequency polygons, frequency curves and cumulative frequency distribution; Measures of central tendency: Mean, median and mode; Partition values: Quartiles, deciles and percentiles; Measures of dispersion: Range, mean deviation, variance, standard deviation, quartile deviation and coefficient of variation.	2
2	Measures of inequality: Lorenz curve and Gini's co-efficient.	

Suggested Reading

Krishnamurthy, J. (2000). *Rural Development: Problems and Prospects*. Rawat Publications, Jaipur.

Lee, D.A., & Chaudhri, D.P. (Eds.). (1983). *Rural Development and State*. Methuen Publishing.

Misra, R.P., & Sundaram, K.V. (Eds.). (1979). *Rural Area Development: Perspectives and Approaches*. Sterling Publishers, New Delhi.

Singh, K., & Shishodia, A. (2016). *Rural Development: Principles, Policies, and Management* (4th ed.). Sage.

Gilg, A.W. (1985). *An Introduction to Rural Geography*. Edwin Arnold, London.

Misra, R.P. (Ed.). (1985). *Rural Development: Capitalist and Socialist Paths, Vol. 1*. Concept, New Delhi.

Das, N.G. (2009). *Statistical Methods*. McGraw Hill Education (India) Private Limited.

Singh, R.L., & Singh, R.P.B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Mishra, R.P., & Ramesh, A. (1989). *Fundamentals of Cartography*. Concept, New Delhi.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 5

PAPER: MAJOR

Paper Description: AGRICULTURAL GEOGRAPHY

This paper explains the complex interactions between human societies and the environment. It deals with understanding the dynamics of food production and distribution. It covers a variety of topics, including the concept of the factors affecting agriculture, types of farming, condition of growth, world distribution and production of crops, theories of agricultural location, Whittlesey classification of world agriculture region, agricultural regionalization in India, causes and solutions of low productivity in Indian agriculture, agricultural revolutions in India, various agricultural schemes in India and the impact of climate change on agriculture. The practical part deals with understanding the methods of delineating crop combination regions, measuring agricultural efficiency, measuring crop concentration index and crop diversification.

Paper Code: UGEOMAJ35011

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Types of farming, world distribution and production of crops.
- Theories of agricultural location, Whittlesey classification of world agriculture region and agricultural regionalisation in India.
- Agricultural revolutions in India, agricultural schemes in India, the impact of climate change on agriculture and the concept of Climate Smart Agriculture.

Skills Gained:

- Develop skills in methods of delineating crop combination regions proposed.
- Measuring agricultural efficiency, crop concentration index and crop diversification.

Competency Developed:

- Develop an understanding of agriculture and world distribution and production of crops.
- Evolving an analysis regarding theories of agricultural location, regionalisation in India, agricultural revolutions and various agricultural schemes in India.
- Enabling learning power to interpret and analyse methods of delineating crop combination regions, measuring agricultural efficiency, crop concentration index, and crop diversification.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Factors affecting agriculture; Types of farming: Intensive subsistence, extensive commercial, plantation and dairy; Condition of growth, world distribution and production of crops: Wheat, paddy, maize, tobacco, cotton, jute and oil seeds.	3

2	Theories of agricultural landuse: Von-Thunen, Olof Jonasson and Sinclair (peri-urban agriculture); World agriculture regions (Whittlesey); Agricultural regionalisation in India: Randhawa, Sengupta and ICAR.	
3	Low productivity in Indian agriculture: Causes and solutions; Agricultural revolutions in India: Green, white and blue; Agricultural schemes in India: NFSM, PMKSY, PMFBY; Impact of climate change on agriculture; Concept of climate smart agriculture.	

Practical

Unit	Content	Hours/Week
1	Delineating crop combination regions after Weaver and Rafiullah.	2
2	Measuring agricultural efficiency (Bhatia), crop concentration index (Bhatia) and crop diversification (Gibbs-Martin Index).	

Suggested Reading

Vaidya, B.C. (1997). *Agricultural Land Use in India*. Manak Publications.

Gregor, H.P. (1970). *Geography of Agriculture*. Prentice-Hall, New York.

Husain, M. (1996). *Systematic Agricultural Geography*. Rawat Publications, Jaipur.

Mohammad, A. (1978). *Studies in Agricultural Geography*. Rajesh Publications, New Delhi.

Morgan, W.B., & Norton, R.J.C. (1971). *Agricultural Geography*. Methuen, London.

Sauer, O.C. (1969). *Agricultural Origins and Dispersals*. MIT Press, Cambridge.

Shafi, M. (2006). *Agricultural Geography*. Pearson Education, New Delhi.

Sen, Sudhir (1975). *Reaping the Green Revolution*. Tata McGraw-Hill, New Delhi.

Singh, J., & Dhillon, S.S. (2000). *Agricultural Geography*. Tata McGraw Hill, New Delhi.

Singh, S. (1994). *Agricultural Development in India: A Regional Analysis*. Kaushal Publications, Shillong.

Symons, L. (1967). *Agricultural Geography*. George Bell and Sons, London.

Tarrant, J.R. (1974). *Agricultural Geography*. John Wiley and Sons, New York.

Basu, D.N., & Guha, G.S. (1996). *Agro-Climatic Regional Planning in India, Vol.I & II*. Concept Publication, New Delhi.

Burger, A. (1994). *Agriculture of the World*. Aldershot, Avebury.

Grigg, D.B. (1984). *Introduction to Agricultural Geography*. Hutchinson, London.

Ilbery, B.W. (1985). *Agricultural Geography: A Social and Economic Analysis*. Oxford University Press.

Mohammad, N. (1992). *New Dimension in Agriculture Geography, Vol. I to VIII*. Concept Pub., New Delhi.

Hussain, M. (1978). *Agricultural Geography*. Rawat Publication, Jaipur.

Sarkar, A. (2015). *Practical Geography: A Systematic Approach* (3rd ed.). Orient Blackswan Private Ltd.

Shafi, M. (2005). *Agricultural Geography*. Pearson.

Practical guidelines: **Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.**

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 5

PAPER: MAJOR

Paper Description: GEOGRAPHICAL THOUGHT

This paper describes geographic thought and typically delves into the evolution, theories, philosophies, and methodologies that have shaped the field of geography over time. In particular, the theoretical part of the course covers the evolution of geography in the ancient period, the development of geography in the medieval period, the development of the age of voyages and exploration, the development of geography in the modern age, Dualism in geography, Positivism and quantitative revolution and Welfare geography. In contrast, the practical part covers the concept of levelling and surveying, surveying by Prismatic Compass, levelling by Dumpy Level, determining height by Theodolite, Plane table survey and graphical representation of data.

Paper Code: UGEOMAJ35012

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- The evolution of geography in the ancient period, the development of geography in the medieval period, and the development of the age of voyages and exploration.
- Development of geography in the modern age and dualism in geography.
- Positivism and quantitative revolution, behaviouralism and welfare geography.

Skills Gained:

- Develop skills in surveying using a Prismatic Compass, levelling by Dumpy Level, and determining height using Theodolite and Plane table survey.
- Graphical representation of data using box plots, scatter plots and band graphs.

Competency Developed:

- Gain competency regarding the evolution of geography in ancient and medieval periods, both in voyages and exploration and in the modern age.
- Enrich students with knowledge of dualism in geography.
- Enable students to be aware of the concept of levelling and surveying, making them efficient by graphical representation of data.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Evolution of geography in ancient period: Contribution of the Greek, Roman and Indian philosophers; Development of geography in medieval period: Dark age, contribution of Arab geographers, development in the age of voyages and exploration.	3

2	Development of geography in modern age: Contribution of German, French, American and British schools of thoughts; Dualism in geography: Physical and human geography, determinism and possibilism, regional and systematic geography.	
3	Positivism and quantitative revolution; Concept of space and time in geography; Behaviouralism; Radical geography; Welfare geography.	

Practical

Unit	Content	Hours/Week
1	Concept of levelling and surveying; Surveying by Prismatic Compass (closed traverse); Levelling by Dumpy Level along a given line and computation of reduced level by rise and fall and collimation methods; Determination of height of an object with accessible and inaccessible base in the same vertical plane by Theodolite (transit); Plane table survey: Radiation and intersection method.	2
2	Graphical representation of data: Box plots, scatter plots and band graphs.	

Suggested Reading

Taylor, G. (Ed.). (1953). *Geography in the Twentieth Century*. Methuen and Company, London.

Soja, E. (1989). *Post-modern Geographies*. Verso, London.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Singh, R. S. (Ed.). (2009). *Indian Geography: Perspectives, Concerns and Issues*. Rawat Publications, Jaipur/New Delhi.

Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. Orient Black Swan Private Ltd., New Delhi.

Rawling, E., & Daugherty, R. (Eds.). (2005). *Geography into the Twenty-first Century* (2nd ed.). John Wiley and Sons, Chichester.

Pete, P. (1998). *Modern Geographical Thought*. Wiley-Blackwell.

Mishra, R. P., & Ramesh, A. (1989). *Fundamentals of Cartography*. Concept, New Delhi.

Martin, G. J. (2005). *All Possible Worlds: A History of Geographical Ideas*. Oxford.

Johnston, R., Gregory, D., Pratt, G., Watts, M., & Whatmore, S. (2003). *The Dictionary of Human Geography* (5th ed.). Blackwell Publishers, Oxford.

Husain, M. (2015). *Evolution of Geographical Thought* (6th ed.). Rawat Publications, Jaipur.

Holt-Jensen, A. (1980). *Geography: Its History and Concepts*. Harper and Row Publishers, London.

Harvey, D. (1969). *Explanations in Geography*. Arnold, London.

Hartshone, R. (1959). *Perspectives of Nature of Geography*. Rand MacNally and Co.

Dikshit, R. D. (2004). *Geographical Thought: A Contextual History of Ideas*. Prentice Hall India.

Cresswell, T. (2013). *Geographic Thought: A Critical Introduction*. Wiley-Blackwell.

Couper, P. (2015). *A Student's Introduction to Geographical Thought: Theories, Philosophies, Methodologies*. Sage.

Adhikari, S. (2015). *Fundamentals of Geographical Thought*. Orient Blackswan.

Practical guidelines: **Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.**

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 5

PAPER: MINOR

Paper Description: ECONOMIC GEOGRAPHY

Economic Geography is a field of study that explores the spatial, specifically focusing on activities, resources, and their impacts on regional development. This paper provides an overview of key concepts such as location theory, industrial organization, crop distribution and regional economic disparities. It examines how geographical factors influence economic processes, including the role of transportation, urbanization, and natural resources. Through a multidisciplinary approach, it aims to elucidate the complex interplay between geography, economy, and society. The practical part will allow students to enrich their knowledge through data organizing, statistical tools and techniques.

Paper Code: UGEOMIN30003

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Acquire a solid grasp of the nature and scope of economic geography, the Concept and classification of economic activities, the definition and classification of resources, and Economic theories, including Von Thunen's agriculture theory and the Industry theory of Weber & Losch.
- Learner in-depth knowledge of conditions of growth and world distribution of various crops, including wheat, rice, cotton, tea and coffee, major fishing grounds of the world, and characteristics of lumbering in tropical and temperate forests.
- Explore the production and world distribution of Iron-steel, cotton textile and paper industry, modes of transport, Geographical factors of transport development, and factors affecting international trade.

Skills Gained:

- Gain the ability to organize data, which includes frequency distribution tables, histograms, frequency polygons, frequency curves and cumulative frequency distribution; measure mean, median and mode; measure range, mean deviation, variance, standard deviation and coefficient of variation.
- Develop proficiency in measures of inequality and traffic flow diagram.

Competency Developed:

- Become adept at critically analyzing economic geography and understanding the economic theories.
- Make students more competent by enriching their knowledge regarding conditions of growth and world distribution of crops, major fishing grounds of the world, production and world distribution of Iron-steel, cotton textile and paper industry.
- Develop understanding about modes of transport, geographical factors of transport development, factors affecting international trade.
- The practical exercises equip students with the competence to organize data effectively.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Nature and scope of economic geography; Concept and classification of economic activities; Definition and classification of resources; Economic theories: Agriculture (Von Thunen) and industry (Weber & Losch).	3
2	Conditions of growth and world distribution of wheat, rice, cotton, tea and coffee; Major fishing grounds of the world; Characteristics of lumbering in tropical and temperate forests.	
3	Production and world distribution of iron-steel, cotton textile and paper industry; Modes of transport; Geographical factors of transport development; Factors affecting international trade.	

Practical

Unit	Content	Hours/Week
1	Organizing data: Frequency distribution tables, histograms, frequency polygons, frequency curves and cumulative frequency distribution; Measures of central tendency: Mean, median and mode; Measures of dispersion: Range, mean deviation, variance, standard deviation and coefficient of variation.	2
2	Measures of inequality: Lorenz curve and Gini's co-efficient; Traffic flow diagram.	

Suggested Reading

Combes, P., Mayer, T., & Thisse, J. F. (2008). *Economic Geography: The Integration of Regions and Nations*. Princeton University Press.

Wheeler, J. O. (1998). *Economic Geography*. Wiley.

Durand, L. (1961). *Economic Geography*. Crowell.

Bagchi-Sen, S., & Smith, H. L. (2006). *Economic Geography: Past, Present and Future*. Taylor and Francis.

Willington, D. E. (2008). *Economic Geography*. Husband Press.

Clark, G. L., Feldman, M. P., & Gertler, M. S. (Eds.). (2000). *The Oxford Handbook of Economic Geography*. Oxford University Press.

Alexander, J. W. (1963). *Economic Geography*. Prentice-Hall Inc., Englewood Cliffs, New Jersey.

Coe, N. M., Kelly, P. F., & Yeung, H. W. (2007). *Economic Geography: A Contemporary Introduction*. Wiley-Blackwell.

Hodder, B. W., & Lee, R. (1974). *Economic Geography*. Taylor and Francis.

Singh, R.L., & Singh, R.P.B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. New Delhi: Orient Black Swan Private Ltd.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of the practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 6

PAPER: MAJOR

Paper Description: BIOGEOGRAPHY

Biogeography is the study of the distribution of species and ecosystems in geographic space and through geological time. It involves understanding how physical and biological factors interact to shape the patterns of life on Earth. Key aspects of biogeography include examining the biosphere, energy flow in ecosystems, biogeochemical cycles, world biomes, floristic realms and zoogeographical regions of the world, biodiversity, and wildlife conservation projects in India. The practical part covers the determination of plant-species diversity by matrix method, identification of the Xeric Period, Hyetograph and Map projections.

Paper Code: UGEOMAJ36013

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Nature and scope of biogeography, biosphere, concepts of ecology, species, population, community, habitat, ecological niche and succession, concepts of trophic structure, food chain and food web and energy flow in ecosystems.
- Bio-geochemical cycles, classification of world biomes, geographical extent and characteristics of tropical rain forest, taiga, tundra, hot desert, savanna and temperate grassland biomes.
- Floristic realms and zoogeographical regions of the world, biodiversity, wildlife conservation projects in India include tiger, elephant, one-horn rhino, crocodile and Gangetic dolphin conservation.

Skills Gained:

- Develop skills in the determination of plant-species diversity using the matrix method, identification of xeric period using Ombothermic graphs (five weather stations), and hyetograph.
- Gain skills in mathematical/graphical construction of map projections.

Competency Developed:

- Evolving the knowledge within students with the critical thinking regarding various aspects of biogeography including bio-geochemical cycles, world biomes, floristic realms and zoogeographical regions of the world, Biodiversity etc.
- Make students aware regarding various wildlife conservation projects in India.
- Enable students' efficiency regarding matrix method, Ombothermic graphs, Hyetograph and map projections.

Syllabus Overview:

Theory

Unit	Content	Hours/Week
1	Biogeography: Nature and scope; Biosphere: Nature and components; Concepts of ecology, species, population, community, habitat, ecological	3

	niche and succession; Concepts of trophic structure, food chain and food web; Energy flow in ecosystems.	
2	Bio-geochemical cycles with reference to oxygen, carbon, nitrogen and phosphorous; Classification of world biomes (Holdridge and Whittaker); Geographical extent and characteristics of tropical rain forest, taiga, tundra, hot desert, savanna and temperate grassland biomes.	
3	Floristic realms and zoogeographical regions of the world; Biodiversity: Definition, types, threats and conservation measures; Concept of Red Data Book, Green Data Book, endangered and extinct species; Wildlife conservation projects in India (tiger, elephant, one-horn rhino, crocodile and Gangetic dolphin).	

Practical

Unit	Content	Hours/Week
1	Determination of plant-species diversity by matrix method (Shannon-Weiner and Simpson); Identification of Xeric Period by Ombothermic graphs (five weather stations); Hyetograph.	2
2	Map projections: Mathematical/Graphical construction of Simple Conical Projection with One Standard Parallel, Simple Conical Projection with Two Standard Parallel, Bonne's Projection, Sinusoidal Projection, Polyconic Projection, Mollweide's Projection.	

Suggested Reading

Huggett, R. (1998). *Fundamentals of Biogeography*. Routledge, London.

Brown, J. H., & Lomolino, M. V. (2010). *Biogeography* (4th ed.). Sinauer Associates.

Cox, C. B., & Moore, P. D. (2010). *Biogeography: An Ecological and Evolutionary Approach* (8th ed.). Wiley-Blackwell.

Lomolino, M. V., Riddle, B. R., Whittaker, R. J., & Brown, J. H. (2017). *Biogeography* (5th ed.). Sinauer Associates.

Lomolino, M. V., & Heaney, L. R. (2004). *Frontiers of Biogeography: New Directions in the Geography of Nature*. Sinauer Associates.

Myers, N., Mittermeier, R. A., Mittermeier, C. G., da Fonseca, G. A., & Kent, J. (2000). *Biodiversity Hotspots for Conservation Priorities*. Nature Conservancy.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Mishra, R. P., & Ramesh, A. (1989). *Fundamentals of Cartography*. Concept, New Delhi.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20

CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)	10
Attendance	5	5
Full marks		75

Semester: 6

PAPER: MAJOR

Paper Description: URBAN GEOGRAPHY

Urban Geography is a specialized branch of geography that examines the spatial organization and dynamics of cities and urban areas. This paper provides an overview of key themes and theories in urban geography, including urbanization processes, urban morphology, socio-spatial inequalities, and urban planning. It explores how cities evolve, grow, and function as complex systems shaped by demographic trends, economic activities, cultural diversity, and governance structures. The paper discusses urban challenges such as housing affordability, transportation issues, environmental sustainability, and social exclusion. It aims to deepen understanding of urban environments' spatial, social, and economic dimensions. The practical part deals with the hierarchy of urban settlements, ternary diagram, nearest neighbour analysis for clustering and regularity, correlation, and regression.

Paper Code: UGEOMAJ36014

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Definition, scope and content of urban geography, classification of city, urban morphology and central business district, concept of urban growth, urbanization, suburbanization, counter-urbanization, re-urbanization and urban renewal.
- Trends of urbanization, level, trends and patterns of urbanization in India, the concept of conurbation, megacity, million city and global city, rural-urban fringe, urban corridor, satellite towns, urban gentrification.
- Definition and concept of the master plan, the contribution of E. Howard, P. Geddes and Le Corbusier in urban planning, problems of urbanization in India, major urban development schemes in India include JNNURM, AMRUT and Smart Cities Mission.

Skills Gained:

- Gain skill in creating a hierarchy of urban settlements using the rank-size rule, ternary diagram and nearest neighbour analysis.
- Develop skilled proficiency in statistical methods, including correlation and regression, as well as simple bi-variate linear regression.

Competency Developed:

- Deepening the knowledge of students regarding urban morphology, trends of urbanization in developed and developing countries, Urban gentrification, concept of Master Plan, contribution of E. Howard, P. Geddes and Le Corbusier in urban planning, problems of urbanization in India, major urban development schemes in India.
- Enriching skills among students in doing and interpreting rank-size rule, ternary diagram, nearest neighbour analysis and correlation and regression.

Syllabus Overview:

Theory

Unit	Content	Hours/Week
1	Definition, scope and content of urban geography; Classification of city: Harris and Taylor; Urban morphology and central business district; Concept of urban growth, urbanization, suburbanization, counter-urbanization, re-urbanization, urbanism and urban renewal.	3
2	Trends of urbanization: Developed and developing countries; Level, trends and patterns of urbanization in India; Concept of conurbation, megacity, million city and global city; Concept of rural-urban fringe, urban corridor, satellite towns, new town and urban gentrification.	
3	Definition and concept of master plan: A case study of Chandigarh city, Delhi NCR and Salt Lake (Kolkata); Contribution of E. Howard, P. Geddes and Le Corbusier in urban planning; Problems of urbanization in India: Urban poverty, transportation and proliferation of slums; Major urban development schemes in India: JNNURM, AMRUT and Smart Cities Mission.	

Practical

Unit	Content	Hours/Week
1	Hierarchy of urban settlements: Rank-size rule (Zipf); Ternary diagram (Mitra); Nearest neighbour analysis for clustering and regularity.	2
2	Correlation and regression: Pearson's product-moment and Spearman's rank correlation, simple bi-variate linear regression.	

Suggested Reading

Kaplan, D. H., Wheeler, J. O., & Holloway, S. R. (2008). *Urban Geography*. John Wiley.

Knox, P. L., & McCarthy, L. (2005). *Urbanization: An Introduction to Urban Geography*. Pearson Prentice Hall, New York.

Carter, H. (2002). *The Study of Urban Geography* (4th ed.). Jaipur and New Delhi: Rawat Publications. (Original work published 1995)

Hall, P. (1992). *Urban and Regional Planning*. Routledge, London.

Hall, T. (2001). *Urban Geography* (2nd ed.). Routledge, London.

Johnson, J. H. (1981). *Urban Geography*. Pergamon Press, Oxford.

Pacione, M. (2005). *Urban Geography: A Global Perspective*. Routledge, London and New York.

Singh, S. B. (Ed.). (1996). *New Perspectives in Urban Geography*. M.D. Publications, New Delhi.

Stanley, B., Jack, W., & Donald, Z. (Eds.). (2003). *Cities of the World*. Rowman and Littlefield, New York and Oxford.

Knox, P. L., & Pinch, S. (2006). *Urban Social Geography: An Introduction*. Prentice-Hall.

Sassen, S. (2001). *The Global City: New York, London and Tokyo*. Princeton University Press.

Ramachandran, R. (1989). *Urbanisation and Urban Systems of India*. Oxford University Press, New Delhi.

Ramachandran, R. (1992). *The Study of Urbanisation*. Oxford University Press, Delhi.

Singh, R. B. (Ed.). (2001). *Urban Sustainability in the Context of Global Change*. Science Pub., Inc., Enfield, NH, USA and Oxford & IBH Pub., New Delhi.

Singh, R. B. (Ed.). (2015). *Urban Development, Challenges, Risks and Resilience in Asian Megacities*.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 6

PAPER: MAJOR

Paper Description: INDUSTRIAL GEOGRAPHY

Industrial Geography examines industrial activities' spatial distribution, organization, and dynamics within regional and global contexts. This paper provides an overview of key concepts and theories in industrial geography, including location theory, agglomeration economies, industrial clusters, and global production networks. It explores how industrial sectors evolve and interact with geographic factors such as transportation networks, natural resources, and labour markets. Students will make a field report in the practical part.

Paper Code: UGEOMAJ36015

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Nature and scope of industrial geography, types and classification of manufacturing industries, factors of industrial location, and various theories of industrial location.
- Location, production and world distribution of iron-steel and cotton textile industry, production and world distribution of automobile and ship-building industry, world distribution, problems and prospects of paper and heavy chemical industry.
- Industrial regions in several countries, including India, industrial policy of India, 1991, Make in India scheme, 2014.

Skills Gained:

- Producing skills and efficiency in doing fieldwork with a proper field report.

Competency Developed:

- Develop skills in understanding types of manufacturing industries and theories of industrial location.
- Develop competency in exploration regarding location, production, and world distribution of iron-steel and cotton textile industry; production and world distribution of automobile and ship-building industry; World distribution, problems, and prospects of paper and heavy chemical industry.
- Strengthened the knowledge of industrial regions, the industrial policy of India, 1991 and the Make in India scheme, 2014.
- Cultivating research qualities among students with a scientific field report on a specific project.

Syllabus Overview:

Theory

Unit	Content	Hours/Week
1	Nature and scope of industrial geography; Types and classification of manufacturing industries; Factors of industrial location; Theories of industrial location by Weber, Losch, Hoover, Palandat, Smith and Isard.	3

2	Location, production and world distribution of iron-steel and cotton textile industry; Production and world distribution of automobile and ship-building industry; World distribution, problems and prospects of paper and heavy chemical industry.	
3	Industrial regions of India, USA, Russia, Germany, Japan and China; Industrial Policy of India, 1991; Make in India scheme, 2014.	

Practical

Unit	Content	Hours/Week
1	A field report will be prepared by the students in consultation with their respective college teachers on any topic related to physical geography. The report will be prepared based on primary and secondary data collected during field visit which is compulsory. Report should be limited within 40-50 pages, typed in Microsoft word (font: Times New Roman, size: 12 and line spacing 1.5) and may include maps, diagrams, charts and tables. The report will be examined externally and marks will be separately allotted for report and viva-voce taken individually.	2

Suggested Reading

Storper, M., & Scott, A. J. (Eds.). (2016). *Pathways to Industrialization and Regional Development*. Routledge.

Hayter, R. (2013). *Industrial Geography: An Economic Geography Perspective*. Routledge.

Clark, G. L., Feldman, M. P., & Gertler, M. S. (2018). *The Oxford Handbook of Economic Geography*. Oxford University Press.

Scott, A. J. (2013). *The New Global Economy*. Princeton University Press.

Markusen, A. R., & Venables, A. J. (Eds.). (1999). *Firms' Location and Regional Development*. Routledge.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Mishra, R. P., & Ramesh, A. (1989). *Fundamentals of Cartography*. Concept, New Delhi.

Practical guidelines: Although the work on the field report will be done in groups, the students will have to carry their individual copies duly signed by their supervising teacher at the time of viva-voce.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: Field report	5: Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 6

PAPER: MAJOR

Paper Description: FUNDAMENTALS OF REMOTE SENSING

Fundamentals of Remote Sensing is a foundational study that explores the principles, technologies, and applications of remote sensing in environmental science, geography, and related fields. This paper provides an introduction to key concepts such as electromagnetic radiation, sensor systems, image interpretation, and digital image processing techniques. It aims to demonstrate the utility of remote sensing for scientific research, resource management, and policy decision-making. The practical part of this paper is also related to remote sensing, which further strengthens the knowledge of students.

Paper Code: UGEOMAJ36016

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Definition, scope and evolution of remote sensing, various processes of remote sensing and sources of energy, EMR, typology of remote sensing, remote sensing satellites and sensor resolutions.
- Concept, classification and process of photogrammetry, Lidar and Radargrammetry, limitations of photogrammetry, elements of visual image interpretation, pre-processing and image enhancement of digital image, digital image classification.
- Applications of remote sensing, Indian space programmes.

Skills Gained:

- Construct skills in the interpretation of aerial photographs using pocket stereoscopes and satellite images.
- Develop efficiency in image processing and classifying and preparation of thematic maps using QGIS 3.22 software.

Competency Developed:

- Building understanding among learners regarding remote sensing, remote sensing satellites and sensor resolutions, photogrammetry, supervised and unsupervised digital images, applications of remote sensing and Indian space programmes.
- Enable students to interpret Aerial Photographs using a pocket stereoscope and Satellite Images.
- Effectively make students better understand different remote sensing indices using Landsat imagery using QGIS 3.22 software.

Syllabus Overview:

Theory

Unit	Content	Hours/Week
1	Definition, scope and evolution of remote sensing; Process of remote sensing and sources of energy; EMR and its interaction with atmosphere	3

	and earth surface features; Types of remote sensing; Remote sensing satellites and sensor resolutions.	
2	Concept, classification and process of photogrammetry; LiDAR and Radargrammetry; Limitations of photogrammetry; Elements of visual image interpretation; Pre-processing and image enhancement of digital image; Digital image classification: supervised and unsupervised.	
3	Applications of remote sensing: Monitoring of atmospheric conditions, disaster management, land use and land cover changes, agriculture, forestry, hydrology and urban planning; Indian space programmes: DOS and ISRO, IIRS, NRSC and Indian launch programs.	

Practical

Unit	Content	Hours/Week
1	Interpretation of aerial photographs (using pocket stereoscope) and satellite images (visual).	2
2	Image processing and classification (supervised and unsupervised); Preparation of thematic maps of selected areas based on different remote sensing indices using Landsat imagery: NDVI, NDWI, NDBI and SAVI. (all using QGIS 3.22 software)	

Suggested Reading

Rees, W. G. (2001). *Physical Principles of Remote Sensing*. Cambridge University Press.

Wolf, P. R., & Dewitt, B. A. (2000). *Elements of Photogrammetry: With Applications in GIS*. McGraw-Hill.

Campbell, J. B. (2007). *Introduction to Remote Sensing*. Guildford Press.

Jensen, J. R. (2004). *Introductory Digital Image Processing: A Remote Sensing Perspective*. Prentice Hall.

Joseph, G. (2005). *Fundamentals of Remote Sensing*. United Press India.

Lillesand, T. M., Kiefer, R. W., & Chipman, J. W. (2004). *Remote Sensing and Image Interpretation* (Wiley Student Edition). Wiley.

Nag, P., & Kudra, M. (1998). *Digital Remote Sensing*. Concept, New Delhi.

Singh, R. L., & Singh, R. P. B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.

Cracknell, A., & Hayes, L. (1990). *Remote Sensing Year Book*. Taylor and Francis.

Curran, P. J. (1985). *Principles of Remote Sensing*. Longman.

Nag, P. (Ed.). (1992). *Thematic Cartography and Remote Sensing*. Concept Publishing Company.

Reeves, R. G. (Ed.). (1983). *Manual of Remote Sensing* (Vols. 1 and 2). American Society of Photogrammetry and Remote Sensing.

Spurr, R. (1960). *Photogrammetry and Photo Interpretation*. The Roland Press Company.

Survey of India. (1973). *Photogrammetry*. Survey of India.

Practical guidelines: **Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of practical examination.**

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75

Semester: 6

PAPER: MINOR

Paper Description: ECONOMIC GEOGRAPHY

Economic Geography is a field of study that explores the spatial, specifically focusing on activities, resources, and their impacts on regional development. This paper provides an overview of key concepts such as location theory, industrial organization, crop distribution and regional economic disparities. It examines how geographical factors influence economic processes, including the role of transportation, urbanization, and natural resources. Through a multidisciplinary approach, it aims to elucidate the complex interplay between geography, economy, and society. The practical part will allow students to enrich their knowledge through data organizing, statistical tools and techniques.

Paper Code: UGEOMIN30003

Paper Type: Theory + Practical Lab Based-PLB

Credit: 3 credit theory and 1 credit practical.

Class Hours: 3 theory classes per week and 2 practical classes per week. Total 5 classes per week.

Duration of the Examinations: 2 hrs. Theoretical and 2 hrs. Practical Examinations.

Syllabus:

Paper Objectives

Knowledge Acquired:

- Acquire a solid grasp of the nature and scope of economic geography, the Concept and classification of economic activities, the definition and classification of resources, and Economic theories, including Von Thunen's agriculture theory and the Industry theory of Weber & Losch.
- Learner in-depth knowledge of conditions of growth and world distribution of various crops, including wheat, rice, cotton, tea and coffee, major fishing grounds of the world, and characteristics of lumbering in tropical and temperate forests.
- Explore the production and world distribution of Iron-steel, cotton textile and paper industry, modes of transport, Geographical factors of transport development, and factors affecting international trade.

Skills Gained:

- Gain the ability to organize data, which includes frequency distribution tables, histograms, frequency polygons, frequency curves and cumulative frequency distribution; measure mean, median and mode; measure range, mean deviation, variance, standard deviation and coefficient of variation.
- Develop proficiency in measures of inequality and traffic flow diagram.

Competency Developed:

- Become adept at critically analyzing economic geography and understanding the economic theories.
- Make students more competent by enriching their knowledge regarding conditions of growth and world distribution of crops, major fishing grounds of the world, production and world distribution of Iron-steel, cotton textile and paper industry.
- Develop understanding about modes of transport, geographical factors of transport development, factors affecting international trade.
- The practical exercises equip students with the competence to organize data effectively.

Syllabus Overview

Theory

Unit	Content	Hours/Week
1	Nature and scope of economic geography; Concept and classification of economic activities; Definition and classification of resources; Economic theories: Agriculture (Von Thunen) and industry (Weber & Losch).	3
2	Conditions of growth and world distribution of wheat, rice, cotton, tea and coffee; Major fishing grounds of the world; Characteristics of lumbering in tropical and temperate forests.	
3	Production and world distribution of iron-steel, cotton textile and paper industry; Modes of transport; Geographical factors of transport development; Factors affecting international trade.	

Practical

Unit	Content	Hours/Week
1	Organizing data: Frequency distribution tables, histograms, frequency polygons, frequency curves and cumulative frequency distribution; Measures of central tendency: Mean, median and mode; Measures of dispersion: Range, mean deviation, variance, standard deviation and coefficient of variation.	2
2	Measures of inequality: Lorenz curve and Gini's co-efficient; Traffic flow diagram.	

Suggested Reading

Combes, P., Mayer, T., & Thisse, J. F. (2008). *Economic Geography: The Integration of Regions and Nations*. Princeton University Press.

Wheeler, J. O. (1998). *Economic Geography*. Wiley.

Durand, L. (1961). *Economic Geography*. Crowell.

Bagchi-Sen, S., & Smith, H. L. (2006). *Economic Geography: Past, Present and Future*. Taylor and Francis.

Willington, D. E. (2008). *Economic Geography*. Husband Press.

Clark, G. L., Feldman, M. P., & Gertler, M. S. (Eds.). (2000). *The Oxford Handbook of Economic Geography*. Oxford University Press.

Alexander, J. W. (1963). *Economic Geography*. Prentice-Hall Inc., Englewood Cliffs, New Jersey.

Coe, N. M., Kelly, P. F., & Yeung, H. W. (2007). *Economic Geography: A Contemporary Introduction*. Wiley-Blackwell.

Hodder, B. W., & Lee, R. (1974). *Economic Geography*. Taylor and Francis.

Singh, R.L., & Singh, R.P.B. (1999). *Elements of Practical Geography*. Kalyani Publishers.

Sarkar, A. (2015). *Practical Geography: A Systematic Approach*. New Delhi: Orient Black Swan Private Ltd.

Practical guidelines: Students will prepare a laboratory notebook covering all the practical units duly signed by the internal faculty members. Viva-voce is compulsory at the time of the practical examination.

Question Pattern

Type	Marks			Total
Theoretical	1: 5 out of 5	5: 3 out of 5	10: 2 out of 4	40
Practical	15: 1 out of 1	5: Laboratory notebook and Viva-voce		20
CE	10: Mid-term test, class test, seminar presentation, term paper (Any one to be decided by the respective departmental faculty members)			10
Attendance	5			5
Full marks				75