

SYLLABUS

FOUR YEARS UNDERGRADUATE PROGRAMME IN GEOGRAPHY



'সমানো মন্ত সমিতি সমানী'

**UNIVERSITY OF NORTH BENGAL
RAJA RAMMOHUNPUR**

W.E.F: ACADEMIC SESSION 2023-24

Semester: 1

PAPER: MAJOR

Paper Description: Geotectonic

This paper deals with topics in Geotectonic, Scale and Diagrammatic data presentation. In particular, the theoretical part of the course will cover 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 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:

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

Skills gained:

1. Develop skills in constructing linear and comparative scale.
2. Graphical representation of data using line, bar and circle diagrams.

Competency developed:

1. Developing skills in questioning, reasoning, and drawing logical conclusions based on evidence and scientific principles of various theories and concepts related to geotectonic.
2. 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. and Birkeland, G. H., (2012) Geosystems: An Introduction to Physical Geography (8th edition), Pearson Education, New Jersey.

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

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

Singh R. L. and 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. and 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: 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 sources of data.

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:

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

Skills gained:

1. Students will learn how to effectively organize and write a project report incorporating appropriate maps, diagrams, charts and tables.
2. 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:

1. Develop a comprehensive understanding of hazards and disasters, enabling them to recognize and assess potential risks and vulnerabilities in different contexts.
2. Equipped with the knowledge and skills necessary to contribute to the development of effective disaster management plans and strategies.
3. 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	2

	like flood, drought, landslide, earthquake, cyclone, industrial hazards and pandemics.	
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 types or individual cases of hazard and disaster. 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

Pandey, Mrinalini. Disaster Management, Wiley India Pvt. Ltd.

Bhattacharya, Tushar. Disaster Science and Management, McGraw Hill Education (India) Pvt. Ltd.

Singh, Jagbir. Disaster Management: Future Challenges and Opportunities, K W Publishers Pvt. Ltd.

Singhal, J.P. Disaster Management, Laxmi Publications.

Pandharinath, Navale., Rajan, C.K. Earth and Atmospheric Disaster Management: Natural and Man-made, B S Publications.

Singh, R.B. (2005) Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi. Chapter 1, 2 and 3.

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

Practical guidelines: Although the work on project report will be done in group, but the students will have to carry their individual copy 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:

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

Skills gained:

1. Students will develop the ability to analyse geological processes, atmospheric phenomena and oceanic systems.
2. 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. and 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

K.Siddhartha (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. and 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 in settlement geography, scale and map projection. In particular, the theoretical part of the course will cover concept of site and situation, 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 construction of diagonal and vernier scale 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:

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

Skills gained:

1. Develop skills in constructing diagonal and Vernier scales,
2. Expertise in the mathematical/graphical construction and properties of map projections,

Competency Developed:

1. Analyzing the suitability of different locations for settlements and understanding the factors that contribute to their success or decline.
2. Understanding the morphological patterns will enable students to identify and analyse the characteristics of different settlement
3. 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	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, Mercator Projection.	2

Suggested reading

Ghosh, Sumita. (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.

S. D. Maurya. (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:

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

Skills gained:

1. Students will learn how to effectively organize and write a project report incorporating appropriate maps, diagrams, charts and tables.
2. 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:

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

Syllabus Overview:

Theory

Unit	Content	Hours/Week
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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

"Our Common Future" by World Commission on Environment and Development (Brundtland Report).

Baker, Susan. (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, Leonardo., et al. (2005) Debates on sustainable development: towards a holistic view of reality. Switzerland: Environment, Development and Sustainability 7: 501-518.

Muni, S.D., Chaturvedi, S, India and the Millennium Development Goals: Progress and Challenges.

Robertson, Margaret. Sustainable Development: Principles, Policies, and Practices.

Mega, V.P. Sustainable Development: Concepts, Rationalities and Strategies.

Practical guidelines: Although the work on project report will be done in group, but the students will have to carry their individual copy 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:

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

Skills gained:

5. Students will develop the ability to analyse geological processes, atmospheric phenomena and oceanic systems.
6. They will learn to interpret maps, diagrams and data related to earth science.

7. Students will acquire skills in constructing different types of map projections, including polar zenithal gnomonic, simple conical and cylindrical equal area projection.
8. They will develop the ability to observe and identify geological and climatic features.

Competency developed:

5. Students will develop critical thinking skills by analyzing and evaluating complex geological and atmospheric processes.
6. Students will develop an understanding of the earth's natural systems and the impact of human activities on the environment.
7. They will learn to interpret and analyse scientific data, including maps, charts and graphs, to draw conclusions and make informed decisions.
8. 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. and 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
- K.Siddhartha (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. and 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