Anekant Education Society's

Tuljaram Chaturchand College, Baramati

(Autonomous)

Two Year Degree Program in Geography

(Faculty of Science & Technology)

CBCS Syllabus

M.A. /M.Sc. (Geography) Part-II Semester -III

For Department of Geography

Tuljaram Chaturchand College, Baramati

Choice Based Credit System Syllabus (2023 Pattern)

(As Per NEP 2020)

To be implemented from Academic Year 2024-2025

Title of the Programme: M.A. /M.Sc. (Geography)

Preamble

AES's Tuljaram Chaturchand College has decided to change the syllabus of various faculties from June, 2023 by taking into consideration the guidelines and provisions given in the National Education Policy (NEP), 2020. The NEP envisions making education more holistic and effective and to lay emphasis on the integration of general (academic) education, vocational education and experiential learning. The NEP introduces holistic and multidisciplinary education that would help to develop intellectual, scientific, social, physical, emotional, ethical and moral capacities of the students. The NEP 2020 envisages flexible curricular structures and learning based outcomes for the development of the students. The credit structure and the courses framework provided in the NEP are nationally accepted and internationally comparable.

The rapid changes in science and technology and new approaches in different areas of Geography and related subjects, Board of Studies in Geography of Tuljaram Chaturchand College, Baramati - Pune has prepared the syllabus of M. A. /M.Sc.- Geography under the Choice Based Credit System (CBCS) by following the guidelines of NEP 2020, NCrF, NHEQF, Prof. R.D. Kulkarni's Report, GR of Gov. of Maharashtra dated 20th April and 16th May 2023 and Circular of SPPU, Pune dated 31st May 2023.

A Master degree in geography will provide students, the knowledge and skills to begin a variety of rewarding careers. Geographers work as urban planners, GIS technicians and analysts, disaster preparedness planners, teachers, environmental scientists, remote sensing analysts, transportation planners, demographers, hydrologists and in a variety of other areas. Students who complete Master degree in Geography, courses will examine the spatial organization of physical features and human activities at a variety of spatial scales from local to global. Students will be able to locate features on the surface of the earth, explain why they are located where they are, and describe how places are similar and/or different. Students will also examine human interactions with the environment and describe how physical and cultural landscapes change through time. Students completing physical geography courses will be able to describe the processes that drive earth's climate, create landforms, and govern the distribution of plants and animals.

Programme Specific Outcomes (PSOs)

1. Ability of Problem Analysis: Student will be able to analyse the problems of physical as well as cultural environments of both rural and urban areas. Moreover, they will try to find out the possible measures to solve those problems.
2. Conduct Social Survey Project: They will be eligible for conducting social survey project, which is necessity for the assessment of development status of a particular group or section of the society.
3. Individual and teamwork: Works effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
4. Application of modern instruments: Students will be able to apply various modern instruments for data collection and field survey.
5. Application of GIS and modern Geographical Map Making Techniques: Students will learn how to prepare map based on GIS by using the modern geographical map-making techniques.
6. Critical Thinking: Students will able to understand and solve the critical problems of physical and cultural environment.
7. Development of Observation Power: As a student of Geography, they will be capable to develop their observation power through field experience and in future, they will be able to identify the socio-environmental problems of a locality.
8. Development of Communication Skill and Interaction Power: After the completion of the course, they will be efficient in their communication skill as well as power of social interaction.
9. Effective Citizenship: Demonstrate empathetic social concern and equity centred national development and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
10. Enhancement of the ability of Management: Demonstrate knowledge and understanding of the management principles and apply these to their own work, as a member and leader in a team, to manage projects. They will perform effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
11. Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions and accept responsibility for them.
12. Understand Environmental Ethics and Sustainability: Understand the impact of the acquired knowledge in societal and environmental contexts and demonstrate the knowledge of need for sustainable development.
13. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context social, environmental and technological changes.

Presentation Skill: Students are being able to understand and write effective reports and design credentials, make effective demonstrations, give and receive clear instruction

Anekant Education Society's

Tuljaram Chaturchand College, Baramati

(Autonomous)

Board of Studies (BOS) in Geography

From 2022-23 to 2024-25

Sr.No.	Name	Designation
1.	**Dr. Arun S. Magar**	Chairman
2.	**Dr. Asaram S. Jadhav**	Member
3.	**Mr. Vinayak D. Chavan**	Member
4.	**Ms. Sayali B.Pawar**	Member
5.	**Ms. Aysha A. Mulani**	Member
6.	**Ms. Aisha S. Tamboli**	Member
6.	**Dr. Santosh Lagad**	Vice-Chancellor Nominee
7.	**Dr. Pravin Kokane**	Expert from other University
8.	**Dr.T. P. Shinde**	Expert from other University
9.	**Dr. Babaji Maskare**	Industry Expert
10.	**Mr. Ganesh Ghanawat**	Meritorious Alumni
11.	**Ms. Komal Pote**	Student Representative
12.	**Mr. Sagar Lokhande**	Student Representative

Anekant Education Society's

Tuljaram Chaturchand College of Arts, Science and Commerce, Baramati

(Autonomous)

Credit Distribution Structure for (M. A./M.Sc. Geography) Part-II SEM-III (2023 Pattern)

Year	Level	Sem.	Major		Research Methodology (RM)	OJT /FP	RP	Cum. Cr.
			Mandatory	Electives				
II	6.5	III	GEO-601-MJM (A) Tropical Geomorphology OR GEO-601-MJM (B)Urban Geography (**Credit 04**) GEO-602-MJM (A) Practical in Tropical Geomorphology OR GEO-602-MJM (B) Practical in Urban Geography (**Credit 02**) GEO-603-MJM (A)Theoretical and Applied Geomorphology OR GEO-603-MJM (B)Geography of Migration (**Credit 04**) GEO-604-MJM (A) Practical in Theoretical and Applied Geomorphology OR GEO-604-MJM (B) Practical in Geography of Migration(**Credit 02**)	GEO-611-MJE Principles of Remote sensing and GIS (**Credit 04**)	-	-	GEO-621-RP Research Project (**Credit 04**)	**20**
Cum. Cr.			**12**	**4**	**-**	**-**	**4**	**20**

Anekant Education Society's

Tuljaram Chaturchand College of Arts, Science and Commerce, Baramati

(Autonomous)

Credit Distribution Structure for (M. A./M.Sc. Geography) Part-II SEM-IV (2023 Pattern)

Year	Level	Sem.	Major		Research Methodology (RM)	OJT /FP	RP	Cum. Cr.
			Mandatory	Electives				
II	6.5	IV	GEO-651-MJM Watershed Management (**Credit 04**) GEO-652-MJM Soil Geography (**Credit 04**) GEO-653-MJM Practical in Watershed Management (**Credit 02**) GEO-654-MJM Practical in Soil Geography (**Credit 02**)	GEO-661-MJE Practical in Remote Sensing and GIS (**Credit 02**)	-	-	GEO-681-RP Research Project (**Credit 06**)	**20**
Cum. Cr.			**12**	**2**	**-**	**-**	**6**	**20**

Anekant Education Society's

Tuljaram Chaturchand College of Arts, Science and Commerce, Baramati (Autonomous)

Course Structure for (M. A. /M.Sc. Geography) Part-I (2023 Pattern)

Sem	Course Type	Course Code	Course Title	Theory/ Practical	No. of Credits
I	Major Mandatory	GEO-501-MJM	Principles of Geomorphology and Climatology	Theory	04
		GEO-502-MJM	Principles of Economic and Population Geography	Theory	04
		GEO-503-MJM	Practical in Physical Geography	Practical	02
		GEO-504-MJM	Practical in Human Geography	Practical	02
	Major Elective	GEO-511-MJE	Statistical Techniques in Geography	Theory	04
	Research Methodology	GEO-521-RM	Research Methodology in Geography	Theory	04
Total Credits Semester I					**20**
II	Major Mandatory	GEO-551-MJM (A)	Fluvial Geomorphology	Theory	04
		GEO-551-MJM (B)	Population Geography		
		GEO-552-MJM (A)	Practical in Fluvial Geomorphology	Practical	02
		GEO-552-MJM (B)	Practical in Population Geography		
		GEO-553-MJM (A)	Coastal Geomorphology	Theory	04
		GEO-553-MJM (B)	Geography of Rural Settlement		
		GEO-554-MJM (A)	Practical in Coastal Geomorphology	Practical	02
		GEO-554-MJM (B)	Practical in Geography of Rural Settlement		
	Major Elective	GEO-561-MJE	Geographical Thoughts	Theory	04
	On Job Training/ Field Project	GEO-581-OJT/FP	On Job Training /Field Project	Project	04
Total Credits Semester II					**20**

Anekant Education Society's

Tuljaram Chaturchand College of Arts, Science and Commerce, Baramati (Autonomous)

Course Structure for (M. A. /M.Sc. Geography) Part-II (2023 Pattern)

Sem	Course Type	Course Code	Course Title	Theory/ Practical	No. of Credits
III	Major Mandatory	GEO-601-MJM (A)	Tropical Geomorphology	Theory	04
		GEO-601-MJM (B)	Urban Geography		
		GEO-602-MJM (A)	Practical in Tropical Geomorphology	Practical	02
		GEO-602-MJM (B)	Practical in Urban Geography		
		GEO-603-MJM (A)	Theoretical and Applied Geomorphology	Theory	04
		GEO-603-MJM (B)	Geography of Migration		
		GEO-604-MJM (A)	Practical in Theoretical and Applied Geomorphology	Practical	02
		GEO-604-MJM (B)	Practical in Geography of Migration		
	Major Elective	GEO-611-MJE	Principles of Remote sensing and GIS	Theory	04
	Research Project	GEO-621-RP	Research project	Project	04
	Skill Development	GEO-631-SDC	Fundamentals of Computer Geography	Theory	02
Total Credits Semester III					**22**
IV	Major Mandatory	GEO-651-MJM	Watershed Management	Theory	04
		GEO-652-MJM	Soil Geography	Theory	04
		GEO-653-MJM	Practical in Watershed Management	Practical	02
		GEO-654-MJM	Practical in Soil Geography	Practical	02
	Major Elective	GEO-661-MJE	Practical in Remote Sensing and GIS	Practical	02
	Research Project	GEO-681-RP	Research Project	Project	06
	Skill Development	GEO-691-SDC	Techniques in Computer Geography	Theory	02
Total Credits Semester IV					**22**
Total Credits of all Semester					**84**

CBCS Syllabus as per NEP 2020 for M.A / M.Sc. II (2023 Pattern)

Name of the Programme : M.A / M.Sc. Geography
Programme Code : PAGEO
Class : M.A / M.Sc. II
Semester : III
Course Type : Major Mandatory (Theory)
Course Code : GEO-601-MJM (A)
Course Title : Tropical Geomorphology
No. of Credits : 04
No. of Lectures : 60

Course Objectives:

1. To define the tropical environment and identify its key characteristics, including the peculiarities of tropical climate and the classification of tropics.
2. To identify and analyze the factors influencing weathering processes in tropical environments.
3. To explore the nature, development, and distribution of deep weathering profiles in tropical regions.
4. To classify duricrusts and laterites based on site, morphology, and chronology.
5. To analyze lateritic profiles and understand landform development on laterites.
6. To understand the process of chemical denudation and its role in landscape evolution.
7. To explore the formation mechanisms and different types of planation surfaces.

Course Outcomes:

By the end of the course, students will be able to:

CO 1. Articulate a clear understanding of the tropical environment, including its defining features and climatic peculiarities.

CO 2. Explain the various factors that contribute to weathering in tropical environments and their effects on landscape morphology.

CO 3. Analyze deep weathering profiles in tropical regions, recognizing their characteristics and significance in landscape evolution.

CO4. Categorize duricrusts and laterites according to site characteristics, morphology, and chronology.

CO5. Demonstrate an understanding of lateritic profiles and their role in the development of landforms associated with laterites.

CO6. Demonstrate comprehension of chemical denudation processes, including dissolution, hydration, and oxidation, and their impacts on landforms.

CO7. Identify and classify various types of planation surfaces and explain their formation mechanisms, such as fluvial erosion, weathering, or tectonic uplift.

Topics and Learning points

Unit 1: Introduction to Tropics **Teaching Hours**

1.1 Tropical Environment – Definition **12**

1.2 Peculiarities of tropical climate

1.3 Classification of Tropics

1.4 Morphogenetic regions

Unit 2: Tropical Weathering **12**

2.1 Factors influencing the weathering

2.2 Solubility and Mobility of minerals in Tropics

2.3 Deep weathering profiles: nature, development and distribution

2.4 Process of soil formation in Tropics and types of tropical soils

2.5 Clay minerals

Unit 3: Duricursts and Laterites **12**

3.1 Duricursts and Laterites – Definition

3.2 Properties and world distribution with reference to India

3.3 Classification by site, Morphology and chronology

3.4 Lateritic Profile and landform development on laterites

3.5 Theories of origin of iron in laterites

Unit 4: Denudation and Tropical Landscape **12**

4.1 Mass movement: Types & Processes

4.2 Process of chemical denudation

4.3 Slope and valley forms

4.4 Domed and boulder inselbergs

4.5 Hillslopes and Pediments

Unit 5: Tropical Planation **12**

5.1 Formation and Types of planation surfaces

5.2 Morphology of planation surfaces

5.3 Peneplains, Pediplains and Etchplains

5.4 Double surface of planation

Reference:

Reference Books:

1. Andrew Goudie, (1985): Duricrusts in tropical and subtropical landscapes, Allen Unwin, London.
2. Andrew Goudie, (1987): Environmental change.
3. Budel J. (1982) Climatic geomorphology, Princeton University Press.
4. Douglas j. & Spencer, (1985): Environmental change & Tropical geomorphology, George Allen & Unwin.
5. Feniran A. 7 Jeje L.K. (1983): Humid tropical geomorphology
6. Thomas, M. F. (1994): Geomorphology in the Tropics, John Wiley and Sons, Chichester
7. Thomas M.F. (1974): Tropical geomorphology, McMillan, London.
8. Tricart J. (1972): Landforms of the humid tropics, forests and Savanna, Longman, London.
9. Joshi, V. U. (2022). An Introduction to Tropical Geomorphology. Manglam Publications

Mapping of Program Outcomes with Course Outcomes

Course Code and Title - GEO-601-MJM (A) **-**Tropical Geomorphology

Weightage: 0= No relation, 1= Weak relation , 2= Moderate relation, 3= Strong relation

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	1	0	0	2	1	0	0	0
CO2	3	3	1	0	0	1	1	0	0	0
CO3	3	2	1	0	0	2	1	0	0	0
CO4	2	1	1	1	0	1	1	1	1	0
CO5	2	1	1	0	0	1	1	0	0	0
CO6	2	1	1	0	0	2	1	0	0	0
CO7	2	1	1	0	0	1	2	1	0	0

Justification for Ratings:

PO1 (Comprehensive Knowledge and Understanding): CO1, CO2, and CO3 are rated 3 as they directly contribute to a thorough understanding of the tropical environment, weathering, and landscape evolution. Other COs provide additional knowledge but may not articulate as clearly, rated 2.

PO2 (Application of knowledge and skills): CO1, CO2, and CO3 are rated 3 as they provide foundational knowledge applicable to analyzing tropical environments. Other COs are rated 1 as they may not directly involve application skills but contribute to the theoretical understanding.

PO3 (Constitutional, humanistic, ethical, and moral values): None of the COs directly relate to constitutional, humanistic, ethical, and moral values, hence rated 1.

PO4 (Employability and job-ready skills, and entrepreneurship skills): CO4 is rated 1 as it involves skills relevant to employability and job readiness. Other COs do not directly address this PO, rated 0.

PO5 (Autonomy, Responsibility, and Accountability): None of the COs directly relate to autonomy, responsibility, and accountability, hence rated 0.

PO6 (Research Skills): CO1, CO3, and CO6 are rated 2 as they involve research-related activities. Other COs are rated 1 as they may not directly involve research skills.

PO7 (Critical and Creative Thinking): CO7 is rated 2 as it involves critical thinking in identifying and classifying planation surfaces. Other COs are rated 1 as they may not directly involve critical or creative thinking.

PO8 (Problem-solving Abilities): CO4, CO7, and CO5 are rated 1 as they involve problem-solving in categorizing duricrusts, laterites, and planation surfaces. Other COs are rated 0 as they may not directly involve problem-solving abilities.

PO9 (Collaboration and Teamwork): None of the COs directly relate to collaboration and teamwork, hence rated 0.

PO10 (Digital and technological skills): None of the COs directly relate to digital and technological skills, hence rated 0.

CBCS Syllabus as per NEP 2020 for M.A / M.Sc. II (2023 Pattern)

Name of the Programme : M.A / M.Sc. Geography
Programme Code : PAGEO
Class : M.A / M.Sc. II
Semester : III
Course Type : Major Mandatory (Theory)
Course Code : GEO-601-MJM (B)
Course Title : Urban Geography
No. of Credits : 04
No. of Lectures : 60

Course Objectives:

1. To enable the students to understand different urban definitions and concepts.
2. To acquaint the students different models related to urban and cities.
3. Students can learn classification of cities.
4. Students can understand morphology of cities.
5. Students will familiarize with the classification of Towns and Cities.
6. Students will understand the demographical structure of cities in India and world.
7. Students will know urban development policies in India.

Course Objectives:

By the end of the course, students will be able to:

CO1. Understand the fundamental concepts and theories in urban geography, including urbanization processes, spatial patterns, and the dynamics of urban systems.

CO2. Analyze the spatial organization and structure of cities, including factors influencing land use, transportation, and socioeconomic characteristics.

CO3. Identify and evaluate the historical and contemporary factors shaping urban development, including economic, political, cultural, and environmental forces.

CO4. Demonstrate knowledge of urban planning principles and practices, including urban design, land-use planning, and sustainable development strategies.

CO5. Apply geographic research methods and spatial analysis techniques to investigate urban phenomena, such as demographic trends, gentrification, urban sprawl, and urban environmental issues.

CO6. Critically assess the impacts of urbanization on society, including issues related to social equity, segregation, poverty, and governance.

CO7. Recognize the interconnectedness of urban areas within broader regional, national, and global contexts, and analyze the processes of globalization and urbanization.

Topics and Learning points

Unit 1: Urbanization **Lectures**

1.1 Meaning of Urban settlement and urbanization**.** **12**

1.2 Review of spatial- temporal variations in urbanization in the world

1.3 Urbanization curve

1.4 Contemporary factors of urbanization

Unit 2: Urban Morphology **12**

2.1 Park and Burgess Model

2.2 Homer Hoyet Model

2.3 Harris and Ullman Model

2.4 Characteristics and demarcation of CBD

Unit – 3: Urban Characteristics and Classification **12**

3.1 Growth of Urban population

3.2 Density of population incites

3.3 Age, sex and occupational structure

3.4 Criteria used for classification

3.5 Functional classification of towns and cities

Unit – 4: Central Place **12**

4.1 Christaller's Central Place Theory

4.2 Rank-size relationship and rank- size rule

4.3 Hierarchy of urban settlements

Unit – 5: Urban issues, policies and planning **12**

5.1 Price of land and vertical and horizontal growth of cities

5.2 Scarcity of housing and growth of slums

5.3 Problems of civic amenities

5.4 Urban transport problem

5.5 Urban Environmental pollution

5.6 Urban development policy in India

5.7 Need &Element of city plan

5.8 Use of GIS in Urban Planning

References Books:

1. Bhattacharya: Urban Development in India, Shreepublication
2. Brian, R.K. (1996): Landscape of Settlement Prehistory to present, Routledge,London
3. Careter (1972): Fourth edition: The study of Urban Geography, Arnold,London
4. Hall P. (1992): Urban and Regional Planning, Routedge,London
5. K. Siddharth and S. Mukherji: Cities, Urbanization and UrbanSystems
6. Kundu, A. (1992): Urban Development and Urban Research in India, Khanna Publication
7. Mayer and Kohan: Readings inGeography
8. Northam: UrbanGeography
9. Roy Turner: Indian's UrbanFuture
10. R.B Mandal-V.G A Textbook (Concept publishingCompany
11. Shah ManzooorAlam: Urbanization in DevelopingCountries
12. Singh.K.andSteinberg.F. (eds)(1998): Urban India in Crisis. New AgeInterns

Mapping of Program Outcomes with Course Outcomes

Course Code and Title: GEO 611 MJE (B) **:** Urban Geography

Weightage: 1= Weak or low relation , 2= Moderate or partial relation, 3= Strong or direct relation

Program Outcomes (POs)										
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	1	0	0	0	0	0	0	0	3	0
CO 2	0	1	0	0	0	0	0	0	3	0
CO 3	0	0	0	0	0	0	1	0	3	0
CO 4	0	0	0	0	0	1	0	1	3	0
CO 5	0	0	0	2	0	0	0	0	3	0
CO 6	0	2	1	0	0	0	0	0	3	0
CO 7	0	0	0	0	2	0	0	0	3	0

Justification for the mapping

PO1: Critical and Creative Thinking:

This aligns with CO1, CO3, CO5, and CO6. Students need critical and creative thinking skills to understand fundamental concepts, evaluate factors shaping urban development, apply research methods, and assess the impacts of urbanization on society.

PO2: Communication Skills:

This corresponds to CO5 and CO7. Students will need communication skills to effectively convey their findings when applying geographic research methods and analyzing urban phenomena within broader regional, national, and global contexts.

PO3: Multicultural Competences:

This can be integrated throughout the course as students analyze urban areas, which are often diverse in terms of culture, ethnicity, and socioeconomic status. Understanding and respecting this diversity is essential in interpreting urban phenomena (CO1, CO3, CO6).

PO4: Research Skills:

This relates to CO5, where students apply geographic research methods and spatial analysis techniques to investigate urban phenomena, such as demographic trends and urban environmental issues.

PO5: Environmental Awareness:

This aligns with CO4 and CO6, where students demonstrate knowledge of urban planning principles, sustainable development strategies, and assess the impacts of urbanization on society and the environment.

PO6: Problem Solving Abilities:

This corresponds to CO2, CO4, CO5, and CO6. Students need problem-solving abilities to analyze the spatial organization of cities, apply urban planning principles, investigate urban phenomena, and assess the impacts of urbanization on society.

PO7: Collaboration and Teamwork:

While not explicitly addressed in the COs listed, collaboration and teamwork skills may be developed through group projects, discussions, and presentations related to urban geography.

PO9: Digital and Technological Skills:

This can be integrated into CO5, where students apply geographic research methods and spatial analysis techniques using digital tools.

CBCS Syllabus as per NEP 2020 for M.A / M.Sc. II (2023 Pattern)

Name of the Programme : M.A / M.Sc. Geography
Programme Code : PAGEO
Class : M.A / M.Sc. II
Semester : III
Course Type : Major Mandatory (Practical)
Course Code : GEO-602-MJM (A)
Course Title : Practical in Tropical Geomorphology
No. of Credits : 02
No. of Lectures : 60

Course Objectives:

1. To understand and apply various chemical weathering indices for interpreting landscape evolution and soil formation processes.
2. To identify and describe important clay minerals, including their properties and significance in soil science.
3. To conduct field studies of tropical landscapes, including observation, data collection, and interpretation of geomorphic features.
4. To analyze and interpret laterite profiles and lithosections to understand their formation processes and implications for landscape development.
5. To calculate the Universal Soil Loss Equation (USLE) and assess its application in predicting soil erosion rates.
6. To demonstrate proficiency in preparing soil samples for textural analysis, including sampling techniques and laboratory procedures.
7. To perform textural analysis using the sieve method to determine soil particle size distribution and classify soils based on texture.

Course Outcomes:

By the end of the course, students will be able to:

CO1. Interpret chemical weathering indices to analyze landscape evolution and soil development processes.

CO2. Identify important clay minerals and evaluate their properties, contributing to a deeper understanding of soil composition and behavior.

CO3. Demonstrate field study skills in tropical landscapes, including data collection, observation, and interpretation of geomorphic features.

CO4. Analyze laterite profiles and lithosections, gaining insights into the formation and development of lateritic landscapes.

CO5. Calculate the Universal Soil Loss Equation (USLE) and assess its applicability in predicting soil erosion rates in various environments.

CO6. Prepare soil samples for textural analysis accurately, demonstrating proficiency in sampling techniques and laboratory procedures.

CO7. Perform textural analysis using the sieve method, accurately determining soil particle size distribution and classifying soils based on texture characteristics.

Topics and Learning points

Unit 1: Tropical weathering reaction series **20**

1.1 Calculation of Bowen's Reaction Series

1.2 Calculation of Golditch's weathering sequence

1.3 Interpretations of Chemical Weathering Indices

1.4 Listing of important clay minerals and their properties

Unit 2: Field study of Tropical landscape **20**

2.1 Study and interpretation of weathering profiles

2.2 Study and interpretation of laterite profiles/lithosections

2.3 Calculation of Universal Soil Loss Equation (USLE)

2.4 Collection of tropical soil sample

Unit 3: Textural analysis of tropical soil samples **20**

3.1 Preparation of soil sample for textural analysis

3.2 Textural analysis through sieve method

3.3 Plotting of textural data and calculation of textural parameters

3.4 Interpretation of textural data for tropical geomorphic processes

Reference:

1. Budel, J. (1982). Climatic Geomorphology. Princeton: Princeton University Press.

2. Faniran, A., & Jeje, L. K. (1983). Humid Tropical Geomorphology. London: Longman.

3. Goudie, A. (1985). Duricrusts in Tropical and Sub Tropical Landscapes. Australia: Alien Unwin.

4. Goudie, A. S. (2004): (Eds.), Encyclopedia of Geomorphology, Routledge, London System for the ARIES AUV, Monterey, California: Naval Postgraduate School; Springfield

5. Gupta, A. (2011). Tropical Geomorphology. London: Cambridge University Press.

6. Thomas, M. F. (1994). Geomorphology in the Tropics: A study of Weathering and Denudation in Low Latitudes. Chichester: John Wiley and Sons.

7. Joshi, V. U. (2022). An Introduction to Tropical Geomorphology. Manglam Publications

Mapping of Program Outcomes with Course Outcomes

Course Code and Title: GEO-602-MJM (A **)** Practical in Tropical Geomorphology

Weightage: 0= No relation, 1= Weak relation , 2= Moderate relation, 3= Strong relation

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	0	0	0	2	0	0	0	0
CO2	2	2	0	0	0	0	0	0	0	0
CO3	1	2	2	0	0	3	0	0	2	1
CO4	0	1	0	2	0	0	0	2	0	0
CO5	0	0	0	1	0	0	0	1	0	0
CO6	0	0	0	0	0	2	0	0	0	1
CO7	0	0	0	0	0	0	2	0	2	0

Justification for Ratings:

PO1 (Comprehensive Knowledge and Understanding): CO1 and CO2 are rated 3 as they directly contribute to a thorough understanding of soil composition and landscape evolution. CO3 provides some insight into field study skills, hence rated 1.

PO2 (Application of knowledge and skills): CO1, CO2, and CO3 are rated 2 as they involve applying knowledge and skills in interpreting weathering indices, evaluating clay minerals, and demonstrating field study skills. Other COs are rated 0 as they do not directly involve application skills.

PO3 (Constitutional, humanistic, ethical, and moral values): None of the COs directly relate to constitutional, humanistic, ethical, and moral values, hence rated 0.

PO4 (Employability and job-ready skills, and entrepreneurship skills): CO4, CO6, and CO7 are rated 2 as they involve skills relevant to employability and job readiness in analyzing laterite profiles, preparing soil samples, and performing textural analysis. Other COs are rated 0 as they may not directly address this PO.

PO5 (Autonomy, Responsibility, and Accountability): None of the COs directly relate to autonomy, responsibility, and accountability, hence rated 0.

PO6 (Research Skills): CO3 and CO6 are rated 3 as they involve research-related activities in field study skills and laboratory procedures. CO1 is rated 2 as it involves interpreting chemical weathering indices. Other COs are rated lower as they may not directly involve research skills.

PO7 (Critical and Creative Thinking): CO3 and CO7 are rated 2 as they involve critical thinking in field study skills and soil classification. Other COs are rated 0 as they may not directly involve critical or creative thinking.

PO8 (Problem-solving Abilities): CO4 and CO7 are rated 2 as they involve problem-solving in analyzing laterite profiles and performing textural analysis. Other COs are rated 0 as they may not directly involve problem-solving abilities.

PO9 (Collaboration and Teamwork): CO3 and CO4 are rated 2 as they involve teamwork in field study skills and soil analysis. Other COs are rated 0 as they may not directly involve collaboration and teamwork.

PO10 (Digital and technological skills): None of the COs directly relate to digital and technological skills, hence rated 0.

CBCS Syllabus as per NEP 2020 for M.A / M.Sc. II (2023 Pattern)

Name of the Programme : M.A / M.Sc. Geography
Programme Code : PAGEO
Class : M.A / M.Sc. II
Semester : III
Course Type : Major Mandatory (Practical)
Course Code : GEO-602-MJM (B)
Course Title : Practical in Urban Geography
No. of Credits : 02
No. of Lectures : 60

Course Objectives:

1. Students should be able to identify and analyze different types of urban forms, such as central business districts, suburbs, and industrial zones, and understand the factors that shape their development.
2. Students should learn how to use geographic information systems (GIS) and other spatial analysis tools to examine patterns and processes within urban areas, such as land use, transportation networks, and socio-economic characteristics.
3. Students should gain an understanding of the principles and practices of urban planning, including zoning regulations, land use planning, and sustainable development strategies.
4. Students should understand the role of local government and other stakeholders in urban governance, including issues related to urban policy-making, public participation, and community development.
5. Depending on the practical component of the course, students may engage in fieldwork activities such as site visits, surveys, or interviews to collect data on urban phenomena and apply their analytical skills in real-world settings.
6. Students should develop critical thinking skills to evaluate urban issues from multiple perspectives and propose solutions to complex urban problems.
7. Students should be able to effectively communicate their findings and ideas through written reports, oral presentations, and visual representations such as maps and graphs.

Course Objectives:

By the end of the course, students will be able to:

CO1. Demonstrate proficiency in analyzing and interpreting urban forms and structures through field observations and spatial analysis techniques.

CO2. Apply GIS and other spatial analysis tools to investigate and explain spatial patterns and processes within urban areas, including land use, transportation networks, and demographic trends.

CO3. Analyze the spatial distribution of social and economic inequalities within urban areas and propose strategies to address disparities in access to resources and opportunities.

CO4. Identify and assess environmental challenges facing urban areas, such as air and water pollution, and develop sustainable solutions to promote environmental quality and resilience.

CO5. Evaluate the role of urban governance structures and processes in shaping urban development outcomes, including the influence of local government policies and community engagement initiatives.

CO6. Design and conduct fieldwork activities, such as site visits, surveys, or interviews, to collect primary data on urban phenomena and apply appropriate research methods and techniques.

CO7. Synthesize and communicate findings from fieldwork and data analysis effectively through written reports, oral presentations, and visual representations, demonstrating proficiency in academic writing and presentation skills.

Topics and Learning points Lectures

Unit 1: Measures of Nucleation and Dispersion **20**

1.1 Rank size rule

1.2 Nearest neighbor analysis

1.3 Calculation of centrality

Unit 2: Basic Measures for Urbanization and Calculation of CBD **20**

2.1 Park and Burgess Model

2.2 Homer Hoyet Model

2.3 Harris and Ullman Model

2.4 Vance and Evan‟smethod calculation of CBD

Unit – 3: Urban Index of city distribution and Classification **20**

3.1 Methods of urban renewal and calculation of urban sprawl

3.2 Collection of data on a given problem and report writing

3.3 Growth of Urban population

References Books:

1. Bhattacharya: Urban Development in India, Shreepublication
2. Brian, R.K. (1996): Landscape of Settlement Prehistory to present, Routledge,London
3. Careter (1972): Fourth edition: The study of Urban Geography, Arnold,London
4. Hall P. (1992): Urban and Regional Planning, Routedge,London
5. K. Siddharth and S. Mukherji: Cities, Urbanization and UrbanSystems
6. Kundu, A. (1992): Urban Development and Urban Research in India, Khanna Publication
7. Mayer and Kohan: Readings inGeography
8. Northam: UrbanGeography
9. Roy Turner: Indian's UrbanFuture
10. R.B Mandal-V.G A Textbook (Concept publishingCompany
11. Shah ManzooorAlam: Urbanization in DevelopingCountries
12. Singh.K.andSteinberg.F. (eds)(1998): Urban India in Crisis. New AgeInterns
13. Urban Geography: TimHall
14. Verma: Urban Geography, Rawat,Jaipur

Mapping of Program Outcomes with Course Outcomes

Course Code and Title: GEO 602 MJM: (B) **Course:** Practical in Urban Geography

Weightage: 1= Weak or low relation , 2= Moderate or partial relation, 3= Strong or direct relation

Program Outcomes (POs)										
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	0	0	0	0	0	0	0	0	0
CO 2	0	0	0	0	0	0	3	0	3	0
CO 3	2	0	0	0	0	2	0	0	0	0
CO 4	0	0	0	0	2	3	0	0	0	0
CO 5	0	0	0	3	0	0	0	0	0	0
CO 6	3	0	0	3	0	0	0	0	0	0
CO 7	0	2	0	0	0	0	0	0	0	0

Justification for the mapping

PO1: **Critical and Creative Thinking:**

This aligns with CO1, CO3, and CO6. Students will need to critically analyze urban forms, social and economic inequalities, and environmental challenges, proposing creative solutions.

PO2: **Communication Skills:**

This corresponds to CO7, where students are expected to effectively communicate their findings through various mediums such as written reports, oral presentations, and visual representations.

PO4: **Research Skills:**

This relates to CO6, where students are required to design and conduct fieldwork activities to collect primary data on urban phenomena, applying appropriate research methods and techniques.

PO5: **Environmental Awareness:**

This aligns with CO4, where students identify and assess environmental challenges in urban areas and propose sustainable solutions to promote environmental quality and resilience.

PO6: **Problem Solving Abilities:**

This corresponds to CO3 and CO4, where students analyze social and economic inequalities and environmental challenges within urban areas, proposing strategies and solutions to address them.

PO9: **Digital and Technological Skills:**

This aligns with CO2, where students apply GIS and other spatial analysis tools to investigate spatial patterns and processes within urban areas.

CBCS Syllabus as per NEP 2020 for M.A / M.Sc. II (2023 Pattern)

Name of the Programme : M.A / M.Sc. Geography
Programme Code : PAGEO
Class : M.A / M.Sc. II
Semester : III
Course Type : Major Mandatory (Theory)
Course Code : GEO-603-MJM (A)
Course Title : Theoretical and Applied Geomorphology
No. of Credits : 04
No. of Lectures : 60

Course Objectives:

1. To explore and critically analyze different paradigms in geomorphology, including historical perspectives and contemporary debates.
2. To understand the principles of General System Theory and its application in studying complex geomorphic systems.
3. To elucidate fundamental concepts in geomorphology, such as erosion, deposition, landform evolution, and landscape dynamics.
4. To examine the role of space and time in geomorphological processes and landform development, including temporal and spatial scales.
5. To evaluate various theories and techniques used in geomorphological research, including quantitative methods, remote sensing, and GIS.
6. To apply principles of fluvial and coastal geomorphology to real-world scenarios, including the assessment of river systems and coastal environments.
7. To study and assess the significance of geoheritage and geomorphosites in preserving geological and geomorphological heritage.

Course Outcomes:

By the end of the course, students will be able to:

CO1. Critically evaluate different paradigms in geomorphology, demonstrating an understanding of their historical development and contemporary relevance.

CO2. Apply principles of General System Theory to analyze and interpret complex geomorphic systems and processes.

CO3. Demonstrate proficiency in applying fundamental concepts in geomorphology to analyze and interpret landscapes and landforms.

CO4. Analyze the temporal and spatial dimensions of geomorphological processes, contributing to a comprehensive understanding of landscape evolution.

CO5. Assess the strengths and limitations of various theories and techniques in geomorphological research, demonstrating proficiency in their application.

CO6. Apply knowledge of fluvial and coastal geomorphology to analyze and solve practical problems in environmental management and engineering.

CO7. Evaluate the significance of geoheritage and geomorphosites in cultural and environmental contexts, contributing to conservation and management efforts.

Topics and Learning points

Unit 1: Introduction to Theoretical and Applied Geomorphology **Teaching Hours**

1.1 Definition and Meaning **12**

1.2 History of Geomorphology

1.3 Paradigms in Geomorphology

1.4 General System Theory

Unit 2: Concepts in Geomorphology **12**

2.1 Uniformitarianism & Neo-catastrophism

2.2 Equilibrium & Geomorphic Thresholds

2.3 Climatic Geomorphology

2.4 Tectonic Geomorphology

Unit 3: Space and time in geomorphology **12**

3.1 Time scale: cyclic, graded and steady.

3.2 Magnitude and frequency

3.3 Spatial scales: micro, meso and macro

Unit 4: Theories, techniques and fieldwork in Geomorphology **12**

4.1 Theories in Geomorphology

4.2 Techniques in Geomorphology

4.3 Fieldwork in Geomorphology

4.4 Geomorphometry: general and specific, fractals

Unit 5: Applied Geomorphology **12**

5.1 Nature and objectives

5.2 Geomorphic hazards: fluvial, coastal and hillslope

5.3 Applied fluvial and coastal geomorphology

5.4 Geoheritage and geomorphosites

Reference:

1. Hart, M. G. (1986): Geomorphology, Pure and Applied, George Allen and Unwin, London
2. Chorely, R. J., Schumm, S. A. and Sugden, D. E. (1984): Geomorphology, Methuen, London
3. Hails, J. R. (1977): Applied Geomorphology, Elsevier, Amsterdam
4. Goudie, A. S. (Eds.) (2004): Encyclopedia of Geomorphology, Routledge, London
5. Gregory K. J. and Goudie, A. S. (2011): Handbook of Geomorphology, SAGE, London

Mapping of Program Outcomes with Course Outcomes

Course Code and Title: GEO-603-MJM (A)- Theoretical and Applied Geomorphology

Weightage: 0= No relation, 1= Weak relation , 2= Moderate relation, 3= Strong relation

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	0	0	0	0	2	2	2	1
CO2	3	3	0	0	0	0	2	2	2	1
CO3	3	3	0	0	0	0	2	2	2	1
CO4	3	3	0	0	0	0	2	2	2	1
CO5	3	3	0	0	0	0	2	2	2	1
CO6	3	2	0	0	0	3	3	3	3	2
CO7	2	2	0	0	0	3	3	3	3	2

Justification for Ratings:

PO1 (Comprehensive Knowledge and Understanding): All COs are rated 3 as they contribute significantly to a thorough understanding of geomorphology, including its paradigms, principles, and application in analyzing landscapes.

PO2 (Application of knowledge and skills): All COs are rated 3 as they involve applying advanced technical knowledge and cognitive skills to analyze and interpret complex geomorphic systems and processes.

PO3 (Constitutional, humanistic, ethical, and moral values): None of the COs directly relate to constitutional, humanistic, ethical, and moral values, hence rated 0.

PO4 (Employability and job-ready skills, and entrepreneurship skills): All COs are rated 0 as they may not directly involve employability and job-ready skills.

PO5 (Autonomy, Responsibility, and Accountability): None of the COs directly relate to autonomy, responsibility, and accountability, hence rated 0.

PO6 (Research Skills): CO6 and CO7 are rated 3 as they involve research-related activities in applying geomorphological knowledge to practical problems and evaluating geoheritage significance. Other COs are rated 2 as they may not directly involve research skills.

PO7 (Critical and Creative Thinking): CO6 and CO7 are rated 3 as they involve critical thinking in evaluating environmental management and conservation efforts. Other COs are rated 2 as they may not directly involve critical or creative thinking.

PO8 (Problem-solving Abilities): CO6 and CO7 are rated 3 as they involve problem-solving in environmental management and conservation. Other COs are rated 2 as they may not directly involve problem-solving abilities.

PO9 (Collaboration and Teamwork): All COs are rated 3 as they involve working effectively and respectfully with diverse teams in various contexts of geomorphological research and practical applications.

PO10 (Digital and technological skills): CO6 and CO7 are rated 1 as they may involve the use of ICT and appropriate software in environmental management and conservation. Other COs are rated 2 as they may not directly involve digital and technological skills.

CBCS Syllabus as per NEP 2020 for M.A / M.Sc. II (2023 Pattern)

Name of the Programme : M.A / M.Sc. Geography
Programme Code : PAGEO
Class : M.A / M.Sc. II
Semester : III
Course Type : Major Mandatory (Theory)
Course Code : GEO-603-MJM (B)
Course Title : Geography of Migration
No. of Credits : 04
No. of Lectures : 60

Course Objectives:

1. Students will gain an understanding of the historical, contemporary, and future migration patterns around the world, including the factors driving migration flows.
2. Students will be introduced to various theories and models that explain why people migrate, including push and pull factors, network theories, and structural theories.
3. Students will explore how migration shapes the physical and cultural landscapes of origin, destination, and transit regions, including the impacts on population distribution, economic development, and cultural diversity.
4. Students will examine the social and cultural dimensions of migration, including issues related to identity, belonging, integration, and multiculturalism.
5. Students will analyze migration policies at local, national, and international levels, including the implications of different policy approaches on migration outcomes and migrant experiences.
6. Students will discuss the human rights implications of migration, including issues related to migrant rights, refugee protection, and the ethics of border control and immigration enforcement.
7. Environmental Migration: Students will examine the relationship between environmental change, including climate change, and migration, including the challenges and opportunities associated with environmentally induced migration.

Course Outcomes:

By the end of the course, students will be able to:

CO1: Demonstrate a comprehensive understanding of migration patterns, theories, and concepts in geography, including historical, contemporary, and future trends.

CO2: Use spatial analysis techniques to analyze and interpret migration data, including mapping migration flows and identifying spatial patterns.

CO3: Develop critical thinking skills by critically evaluating different migration theories, policies, and debates within the field of geography.

CO4: Demonstrate the ability to conduct independent research on migration-related topics, including formulating research questions, collecting and analyzing data, and communicating research findings effectively.

CO5: Understand the impacts of migration on places and spaces, including demographic changes, economic development, cultural diversity, and environmental sustainability.

CO6: Analyze migration policies at local, national, and international levels, and evaluate their implications for migration outcomes and migrant experiences

CO7: Understand migration within the context of globalization, including the transnational networks and connections that migrants maintain across borders.

Topics and Learning points

Unit 1: Introduction **Lectures**

1.1 Definition of Migrants and Migration **12**

1.2 Nature and Scope

1.3 Significance of Migration

1.4 Historical overview of migration patterns

Unit 2: Determinants of Migration **12**

2.1 Push and Pull Factors

2.2 Economic factors: labor migration, brain drain

2.3 Social and political factors: conflict-induced migration, refugee flows

2.4 Environmental factors: environmental migration, climate refugees

Unit – 3: Theories of Migration **12**

3.1 Classical theories of migration- push-pull factors, Lee's model

3.2 Contemporary theories- transnationalism, network theory

Unit – 4: Spatial Pattern of Migration **12**

4.1 Internal migration: rural-urban migration, urbanization

4.2 International migration: global migration trends, migration corridors

4.3 International Migration: Problems and Prospects, Pattern of Migration, International

4.4 Laws and Conventions, Environmental Issues and Migration

4.5 Refugee Migration: Global and National Pattern in Refugee Migration

Unit – 5: Migration Policies and Governance **12**

5.1 Immigration policies: border control, visa regimes

5.2 Refugee policies: asylum, resettlement

5.3 Recent Development in Migration in Developed and Developing Countries

5.4 Use of GIS in Migration

References Books:

1. Brown, A.A. ed. (l977): Internal Migration: A Comparative Perspective, Academic Press, NewYork,
2. Cohen, Robin (1996): Theories of Migration, Edward Elga,Cheltenham.
3. Demko, G. et. al (1977) : Population Geog : A Reader, New York, McGrawHill.
4. Harvey, David (1973): Social Justice and City, Edward Arnold and The Johns Hopkins University Press, Baltimore.
5. Jackson. J. A. (1969): Migration. University Press,Cambridge.
6. Jones,E.ed. (1975): Readings in Social Geography, Oxford University Press,Oxford.
7. Khadaria, B. (2010): India Migration Report 2009: Past, Present and Future Outlook, Cambridge University Press, NewDelhi

Mapping of Program Outcomes with Course Outcomes

Course Code and Title: GEO 603 MJM (B) Geography of Migration

Weightage: 1= Weak or low relation , 2= Moderate or partial relation, 3= Strong or direct relation

Program Outcomes (POs)										
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	2	0	2	0	0	2	0	0	0	1
CO 2		0		0	0	0	0	0	3	0
CO 3	2	0	0	0	0	2	0	2	0	0
CO 4	2	3	0	3	0	0	0	0	0	0
CO 5	0	0	2	0	1	0	0	0	0	2
CO 6	1	0	3	0	0	3	0	3	0	2
CO 7	0	0	2	0	0	3	0	2	0	3

Justification for the mapping

PO1: Critical and Creative Thinking:

This aligns with CO1, CO3, CO4, and CO6. Students critically evaluate migration patterns, theories, policies, and debates, demonstrating both critical thinking and creativity in understanding and analyzing migration-related topics.

PO2: Communication Skills:

This corresponds to CO4, where students communicate their research findings effectively. Additionally, communication skills are essential when discussing migration patterns, theories, and impacts in class discussions and presentations.

PO3: Multicultural Competences:

This can be integrated throughout the course as students analyze migration within diverse cultural contexts, considering the experiences and perspectives of migrants from different backgrounds (CO1, CO5, CO6, and CO7).

PO4: Research Skills:

This relates to CO4, where students conduct independent research on migration-related topics, including formulating research questions, collecting and analyzing data. Research skills are fundamental in understanding migration patterns and impacts.

PO5: Environmental Awareness:

While not explicitly addressed in the COs listed, environmental awareness may be relevant when discussing the impacts of migration on environmental sustainability (CO5).

PO6: Problem Solving Abilities:

This corresponds to CO1, CO3, CO5, and CO6. Students develop problem-solving abilities by analyzing migration patterns, evaluating migration policies, and understanding the impacts of migration on places and spaces.

PO8: Value Inculcation:

This can be integrated throughout the course, emphasizing ethical considerations in migration research, policy, and practice, as well as promoting values such as empathy and cultural sensitivity (CO3, CO6, CO7).

PO9: Digital and Technological Skills:

This aligns with CO2, where students use spatial analysis techniques and digital tools to analyze and interpret migration data, including mapping migration flows and identifying spatial patterns.

PO10: Community Engagement and Service:

While not explicitly addressed in the COs listed, opportunities for community engagement and service may arise through fieldwork activities, where students interact with migrant communities and organizations to understand their experiences and needs. This engagement enhances empathy and understanding of migration issues (CO1, CO5, CO6, and CO7).

CBCS Syllabus as per NEP 2020 for M.A / M.Sc. II (2023 Pattern)

Name of the Programme : M.A / M.Sc. Geography
Programme Code : PAGEO
Class : M.A. / M.Sc. II
Semester : III
Course Type : Major Mandatory (Practical)
Course Code : GEO-604-MJM (A)
Course Title : Practical in Theoretical and Applied Geomorphology
No. of Credits : 02
No. of Lectures : 60

Course Objectives:

1. To develop skills in mapping landscape materials using appropriate techniques and tools.
2. To utilize the Munsell color chart effectively for accurately identifying sediment colors in the field.
3. To understand and apply terrain classification methods for analyzing and categorizing landforms.
4. To comprehend and implement Crofts' (1973) critical slope method for assessing specific activities related to slope stability and land use.
5. To conduct comprehensive studies of fluvial/lacustrine sedimentary sequences, including data collection, analysis, and interpretation.
6. To familiarize students with Mialls' facies notations/lithocodes and their application in interpreting sedimentary environments.
7. To interpret sedimentary sequences to understand underlying geomorphic processes and landscape evolution.

Course Outcomes:

By the end of the course, students will be able to:

CO1. Demonstrate proficiency in mapping landscape materials, producing accurate and informative maps of geological and geomorphological features.

CO2. Effectively use the Munsell color chart to identify sediment colors, enhancing their ability to characterize sedimentary environments in the field.

CO3. Apply terrain classification methods to classify and analyze landforms, gaining insights into landscape morphology and processes.

CO4. Apply Crofts' (1973) critical slope method to assess specific activities and make informed decisions regarding slope management and land use planning.

CO5. Conduct independent studies of fluvial/lacustrine sedimentary sequences, demonstrating competence in data collection, analysis, and interpretation.

CO6. Utilize Mialls' facies notations/lithocodes to interpret sedimentary environments and reconstruct past depositional environments.

CO7. Interpret sedimentary sequences to infer underlying geomorphic processes, contributing to a deeper understanding of landscape evolution and dynamics.

Topics and Learning points

Unit 1: Mapping of landscape materials **20**

1.1 Texture, colour and shape of the material

1.2 Zingg's method of shape classification

1.3 Use of Munsell colour chart for identification of sediments colour

1.4 Introduction to use of Sedigraph in textural analysis

Unit 2: Terrain classification methods **20**

2.1 Composite score method

2.2 Crofts (1973) critical slope method for specific activities

2.3 Estimation of fractal dimension of a line

Unit 3: Study of sedimentary sequences in the field **20**

3.1 Study of fluvial/lacustrine sedimentary sequences

3.2 Study of facies and major sedimentary structures

3.3 Mialls' facies notations/lithocodes

3.4 Interpretation of sedimentary sequences for geomorphic processes

Reference:

1. Goudie, A. (1990): Geomorphological Techniques, Unwin Hyman, London
2. Dackombe, R. V. and Gardiner, V. (1983): Geomorphological Field Manual, George Allen and Unwin, London
3. Cooke, R. U. and Doornkamp, J. C. (1974): Geomorphology in Environment Management, Clarendon Press, London
4. Goudie, A. S. (Eds.) (2004): Encyclopedia of Geomorphology, Routledge, London
5. Singh. J. and Dhillon S.S. (1994): Agricultural Geography. Tata McGraw Hill, Publishing Co. Ltd

Mapping of Program Outcomes with Course Outcomes

Course: GEO-604-MJM (A) Practical in Theoretical and Applied Geomorphology

Weightage: 0= No relation, 1= Weak relation , 2= Moderate relation, 3= Strong relation

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	0	0	0	0	0	2	2	2
CO2	2	3	0	0	0	0	0	1	1	2
CO3	2	3	0	0	0	0	0	2	2	2
CO4	2	2	0	3	0	0	0	3	3	1
CO5	2	2	0	2	0	0	0	2	2	1
CO6	2	2	0	0	0	3	0	2	2	1
CO7	2	2	0	0	0	0	3	2	2	1

Justification for Ratings:

PO1 (Comprehensive Knowledge and Understanding): CO1, CO2, CO3, and CO4 are rated 3 as they contribute significantly to a thorough understanding of geological and geomorphological features, sedimentary environments, terrain classification, and slope management. Other COs are rated lower as they may not directly contribute to comprehensive knowledge and understanding.

PO2 (Application of knowledge and skills): All COs are rated 3 as they involve applying advanced technical knowledge and practical skills in mapping landscape materials, characterizing sedimentary environments, and analyzing landforms.

PO3 (Constitutional, humanistic, ethical, and moral values): None of the COs directly relate to constitutional, humanistic, ethical, and moral values, hence rated 0.

PO4 (Employability and job-ready skills, and entrepreneurship skills): CO4, CO5, and CO6 are rated 3 as they involve acquiring skills relevant to slope management, sedimentary sequence analysis, and interpreting sedimentary environments. Other COs are rated lower as they may not directly involve employability skills.

PO5 (Autonomy, Responsibility, and Accountability): None of the COs directly relate to autonomy, responsibility, and accountability, hence rated 0.

PO6 (Research Skills): CO5, CO6, and CO7 are rated 3 as they involve independent study, data collection, analysis, interpretation, and inference of geomorphic processes. Other COs are rated lower as they may not directly involve research skills.

PO7 (Critical and Creative Thinking): CO6 and CO7 are rated 3 as they involve critical thinking in interpreting sedimentary sequences and inferring geomorphic processes. Other COs are rated lower as they may not directly involve critical or creative thinking.

PO8 (Problem-solving Abilities): CO4 and CO7 are rated 3 as they involve problem-solving in slope management and interpreting sedimentary sequences. Other COs are rated lower as they may not directly involve problem-solving abilities.

PO9 (Collaboration and Teamwork): All COs are rated 2 or 3 as they involve working effectively with teams in various contexts of geological and geomorphological research and practical applications.

PO10 (Digital and technological skills): CO1 and CO2 are rated 2 as they involve using digital tools like the Munsell color chart. Other COs are rated lower as they may not directly involve digital and technological skills

CBCS Syllabus as per NEP 2020 for M.A / M.Sc. II (2023 Pattern)

Name of the Programme : M.A / M.Sc. Geography
Programme Code : PAGEO
Class : M.A. / M.Sc. II
Semester : III
Course Type : Major Mandatory (Practical)
Course Code : GEO-604-MJM (B)
Course Title : Practical in Geography of Migration
No. of Credits : 02
No. of Lectures : 60

Course Objectives:

1. To identify and analyze different types of migration patterns, including international, internal, rural-urban, and forced migration, and understand the factors that influence these patterns.
2. To analyze the push and pull factors that drive migration, including economic, social, political, and environmental factors, and understand how these factors interact to shape migration flows.
3. To gain familiarity with key theories of migration, such as neoclassical economics theory, dual labor market theory, world systems theory, and social network theory, and be able to apply these theories to analyze migration phenomena.
4. To understand the role of migration policies in shaping migration flows and outcomes, including policies related to border control, labor migration, asylum, refugee resettlement, and integration, and be able to evaluate the impacts of these policies.
5. To explore the ethical and legal dimensions of migration, including human rights issues, migrant rights, refugee protection, and the challenges of irregular migration, and consider the ethical implications of migration policies and practices.
6. To analyze the demographic impacts of migration on sending and receiving regions, including changes in population size, age structure, and ethnic composition, and

understand the implications for social and economic development.

7. To examine the relationship between environmental change, including climate change, and migration, including the challenges and opportunities associated with environmentally induced migration.

Course Outcomes:

By the end of the course, students will be able to:

CO1: Design and conduct fieldwork activities to collect primary data on migration phenomena, including interviews, surveys, and participant observation, and analyze qualitative and quantitative data using appropriate methods and techniques.

CO2: Demonstrate an understanding of the complex processes of migration, including the factors driving migration decisions, the dynamics of migration flows, and the impacts of migration on sending and receiving communities.

CO3: Integrate concepts and theories from disciplines such as sociology, anthropology, geography, political science, and economics to analyze migration phenomena from an interdisciplinary perspective, recognizing the complex social, economic, and political factors shaping migration dynamics.

CO4: Demonstrate cultural competence and sensitivity in their interactions with migrant communities, recognizing and respecting diverse cultural norms, values, and experiences.

CO5: Apply critical thinking skills to analyze complex migration issues, identify underlying assumptions and biases, and propose creative and evidence-based solutions to migration-related challenges.

CO6: Gain practical experience in conducting fieldwork related to migration, including developing research questions, selecting appropriate research methods, and navigating ethical considerations in research with human subjects.

CO7: Develop professional skills and competencies relevant to careers in migration research, policy analysis, advocacy, and service provision, including teamwork, project management, and cross-cultural communication skills.

Topics and Learning points

Unit 1: Estimates of Migration **Lectures**

1.1 Direct Estimates of Net Migration: Place of Birth and Last Residence **20**

1.2 Duration of Residence and Place of Residence on a Specific Date before the Census

1.3 Indirect Estimates of Net Migration: National Growth Rate Method and Residual Method

1.4 Survival Rate Method: Life Table Survival Rate (LTSR) and Census Survival Rate Method

Unit 2: Measurement of Migration **20**

2.1 Inter-Censal Net Migration by Residual Method

2.2 Inter-Censal Cohort Component Method

2.3 Inter-Censal Component Method for Foreign Born Population

2.4 Estimates of Net Immigration of Alien Population

2.5 Estimates of National Abroad

Unit – 3: Field Work **20**

3.1 Collection of Data on a Given Problem and Report Writing

Reference

1. Jacob S. Siegel and David a. Swanson (2004): The Methods and Materials of Demography, Second Edition, Elsevier Science, USA.
2. John Weeks (2005): Population: An Introduction to Concepts and Issues, Wordsworth Learning. Singapore 9th edition.
3. Mitra R. G., (2002): Understanding Patterns of Migration from Census 2001 Data, Population Stabilization and Development, Council of Cultural Growth and Cultural Relations, Cuttack
4. Shryock, Henry S. Jacob S. Siegel and Associate, (1980): The Methods and Materials of Demography Vol.1
5. U.S. Bureau of the Census, Washington D.C.

6. Todaro, Michael P.(1976), Internal Migration in Developing Countries, International Labour Office, Geneva
7. United Nations, (1974): Methods of Measuring Internal Migration, Manual VI, UN, New York.
8. United Nations, (1979): "Trends and Characteristics of International Migration since 1950" Demographic Studies No. 64, UN, New York
9. United Nations, (1983): Determinants and Consequences of Population Trends, Vol 1, UN, New York, Chapter- VI.

Mapping of Program Outcomes with Course Outcomes

Course Code and Title: GEO 604 MJM: (B) Practical in Geography of Migration

Weightage: 1= Weak or low relation , 2= Moderate or partial relation, 3= Strong or direct relation

Program Outcomes (POs)										
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1	0	1	0	2	0	0	3	0	3	2
CO 2	2	0	0	0	1	2	0	0	0	0
CO 3	2	0	0	2	0	0	0	0	0	0
CO 4	0	3	3	0	0	0	0	2	0	2
CO 5	1	0	0	0	3	2	0	0	0	0
CO 6	2	0	0	3	0	3	0	2	0	0
CO 7	0	2	0	0	0	0	2	0	0	3

Justification for the mapping

PO1: Critical and Creative Thinking:

This aligns with CO2, CO3, CO5, and CO6. Students critically analyze migration processes, integrate concepts from various disciplines, apply critical thinking to migration issues, and propose creative solutions based on evidence.

PO2: Communication Skills:

This corresponds to CO1, CO4, and CO7. Students need communication skills to conduct fieldwork activities, interact with migrant communities, demonstrate cultural competence, and develop professional skills relevant to migration research and service provision.

PO3: Multicultural Competences:

This aligns with CO4, where students demonstrate cultural competence and sensitivity in their interactions with migrant communities, recognizing and respecting diverse cultural norms, values, and experiences.

PO4: Research Skills:

This relates to CO1, CO3, and CO6. Students gain research skills by designing and conducting fieldwork activities, integrating concepts and theories from multiple disciplines, and gaining practical experience in conducting migration-related research.

PO5: Environmental Awareness:

While not explicitly addressed in the COs listed, environmental awareness may be relevant when discussing the impacts of migration on environmental sustainability, which could be integrated into discussions within CO2 and CO5.

PO6: Problem Solving Abilities:

This corresponds to CO2, CO5, and CO6. Students develop problem-solving abilities by analyzing migration processes, identifying underlying assumptions and biases, and proposing evidence-based solutions to migration-related challenges.

PO7: Collaboration and Teamwork:

This aligns with CO1 and CO7, where students collaborate with peers and migrant communities in fieldwork activities, developing teamwork and cross-cultural communication skills relevant to careers in migration research and service provision.

PO8: Value Inculcation:

This can be integrated throughout the course, emphasizing ethical considerations in conducting research with migrant communities and advocating for the rights and well-being of migrants (CO4, CO6).

PO9: Digital and Technological Skills:

While not explicitly addressed in the COs listed, digital and technological skills may be integrated into CO1, where students use technology to collect, analyze, and present data related to migration phenomena.

PO10: Community Engagement and Service:

This aligns with CO1, CO4, and CO7, where students engage with migrant communities in fieldwork activities, demonstrate cultural competence and sensitivity, and develop competencies relevant to service provision and advocacy for migrant rights and well-being.

CBCS Syllabus as per NEP 2020 for M.A / MSc. II (2023 Pattern)

Name of the Programme : M.A / M.Sc. Geography

Programme Code : PAGEO

Class : M.A/M.Sc.-II

Semester : III

Course Type : Major Elective (Theory)

Course Code : GEO-611-MJE

Course Title : Principles of Remote Sensing and GIS

No. of Credits :04

No. of Lectures :60

Course Objectives:

1. To understand the field of Geoinformatics.
2. To provide understanding of fundamentals of GIS, Remote sensing and their applications.
3. To prepare skilled manpower to fulfill the dream of Digital India.
4. To encourage the research and development in the field of Geoinformatics.
5. Understand the principles and types of sensors used in remote sensing.
6. Grasp the concept and types of resolution in remote sensing imagery.
7. Develop skills in visual interpretation and interpretation keys for remote sensing imagery.

Course Outcomes:

By the end of the course, students will be able to:

CO 1. Students will able to understand about remote sensing.

CO 2. Students can understand the satellite remote sensing.

CO 3. Students can do the image processing.

CO4. Students can develop an idea about satellite image interpretation.

CO5. Students will gain insight into sensor technology, its basic principles.

CO6. Students will understand the various types of resolution and their application.

CO7. Students will acquire proficiency in interpreting remote sensing imagery using visual interpretation techniques.

Topics and Learning points

Unit 1: Introduction to Remote Sensing **Teaching Hours**

1.1 Remote Sensing: definition, concept **12**

1.2 Principles of Remote Sensing

1.3 History of Remote Sensing

1.4 Development of Remote Sensing in India

Unit 2: EMR and EMS **12**

2.1 EM Radiation, EM Spectrum, Spectral Signature

2.2 Interaction of EMR with Atmosphere

2.3 Interaction of EMR with Earth's Surface

2.4 Black body Radiation, Laws of Radiation

Unit 3: Platforms and Satellites **12**

3.1 Platform: Types and Characteristics

3.2 Satellites: Geo-stationary and Sun Synchronous

3.3 Earth Resources Satellites: LANDSAT, SPOT, IRS, IKONOS

3.4 Meteorological Satellites: INSAT, NOAA, GOES

Unit 4: Sensors **12**

4.1 Sensors: Concept and Basic Principles

4.2 Types of Sensors: Across track and Along track scanning

4.3 Optical Mechanical Scanners: MSS, TM, LISS, WiFS, PAN

Unit 5: Resolution and Image Interpretation Techniques **12**

5.1 Resolution Concept and Principles

5.2 Types of Resolution- Spectral, Spatial, Radiometric

5.3 Basic Principles, Types, Steps and Elements of Image Interpretation

5.4 Techniques of Visual Interpretation and Interpretation Keys

Reference:

1. Anji Reddy, M. (2004): Geoinformatics for environmental management. B.S. Publications
2. Campbell, J.B. (2002): Introduction to Remote sensing. Taylor Publications.
3. Chang.T.K. (2002): Geographic Information Systems. Tata Mc Graw Hill
4. Drury, S.A. (1987): Image Interpretation in Geology. Allen and Unwin.
5. Francis Tar Bernhardsen. Geographical Information Systems. John Wiley.
6. Gupta, R.P. (1990): Remote Sensing Geology. Springer Verlag.
7. Heywood.I, Cornelius S, Crver Steve. (2003): An Introduction to Geographical Information Systems. Pearson Education
8. Jensen, J.R. (2000): RS of the Environment: An Earth resource Perspective Prentice Hall.
9. Joseph George (2003): Fundamentals of remote sensing. Universities Press.
10. Rencz, A. N. (Ed.). (2016). Remote Sensing for Geologists: A Guide to Image Interpretation. CRC Press.

Mapping of Program Outcomes with Course Outcomes

Course Code and Title: GEO-611-MJE Principle of Remote Sensing and GIS

Weightage: 1= Weak or low relation , 2= Moderate or partial relation, 3= Strong or direct relation

Program Outcomes (POs)										
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10
CO 1	2	0	0	0	0	0	0	0	0	0
CO 2	2	0	0	0	0	0	0	0	0	0
CO 3	2	2	0	0	0	2	0	0	0	2
CO 4	2	2	0	0	0	0	2	0	0	0
CO 5	2	0	0	0	0	0	0	0	0	0
CO 6	2	0	0	0	0	0	0	0	0	0
CO 7	2	2	0	0	0	2	0	0	0	0

PO1: Comprehensive Knowledge and Understanding:

CO1 to CO7 related to the Comprehensive Knowledge and Understanding. For example,

CO1 and CO2 emphasize understanding the concept and application of remote sensing, which is fundamental knowledge in the field. This knowledge provides a broad understanding of how remote sensing works, its applications, and its significance in various fields like environmental monitoring, agriculture, urban planning, etc.

CO3 and CO4 focus on practical skills such as image processing and interpretation of satellite imagery. These skills involve understanding complex data sets, applying algorithms, and extracting meaningful information. They contribute to a comprehensive understanding by bridging theoretical knowledge with practical application.

CO5 delves into sensor technology and its basic principles. Understanding the technology behind remote sensing instruments is crucial for comprehending how data is collected, processed, and analyzed.

CO6 introduces students to various types of resolution in remote sensing, such as spatial, spectral, temporal, and radiometric resolution. Understanding these concepts helps in choosing appropriate data for specific applications and optimizing analysis techniques, thereby enhancing overall comprehension.

CO7 aims at developing proficiency in interpreting remote sensing imagery. This outcome contributes to comprehensive knowledge by enabling students to extract valuable information from imagery, identify features, and understand their spatial context.

PO2: Application of knowledge and skills:

CO3, CO4 and CO7 these outcomes are directly related to the application of knowledge and skills because they involve actively using theoretical concepts and practical techniques to process, interpret, and extract valuable information from remote sensing data. By mastering these skills, students can effectively apply their understanding of remote sensing principles to real-world scenarios, contributing to advancements in various fields such as environmental science, agriculture, urban planning, and disaster management.

PO6: Research Skills

CO3 and CO7 related to image processing and interpreting remote sensing imagery contribute to comprehensive knowledge and understanding in remote sensing by providing students with practical skills and theoretical knowledge necessary for conducting research in the field. These outcomes also foster research skills such as data manipulation, critical thinking, problem-solving, and effective communication, which are essential for conducting rigorous research projects and contributing to advancements in remote sensing science and applications.

PO7: Critical and Creative Thinking:

The outcome related to satellite image interpretation (CO4) contributes to critical and creative thinking by engaging students in the analysis, evaluation, and interpretation of complex spatial data. Through this process, students develop the ability to critically assess information, make reasoned judgments, and creatively generate interpretations and hypotheses based on the available evidence.

PO10: Digital and technological skills:

CO3 is closely related to digital and technological skills, as it involves proficiency in using specialized software tools, programming skills, data management abilities, and problem-solving capabilities to manipulate, analyze, and interpret remote sensing imagery effectively. These digital and technological skills are essential for students pursuing careers in remote sensing, geospatial analysis, environmental science, and related fields, as they enable them to leverage technology to address complex challenges and advance knowledge and innovation in their respective domains.

CBCS Syllabus as per NEP 2020 for M.A./M.Sc. II (2023 Pattern)

Name of the Programme : M.A./M.Sc. Geography
Programme Code : PAGEO
Class : M.A./M.Sc. II
Semester : III
Course Type : Major Mandatory
Course Code : GEO-621-MJM
Course Title : Research Project
No. of Credits : 04
No. of Teaching Hours : 120

Course Objectives:

1. To teach students how to define a research topic, understand its scope, and formulate relevant research questions or hypotheses.
2. To guide students in identifying research gaps and understanding the significance of addressing these gaps within their research.
3. To enable students to search for relevant literature, evaluate and select credible sources, analyze and synthesize information, and write a structured literature review.
4. To instruct students on the components of a research project proposal, including introduction, literature review, study area, objectives, hypothesis, methodology, significance, expected outcomes, chapter scheme, and timeline.
5. To provide students with knowledge on developing a clear and effective research methodology that aligns with their research objectives and hypotheses.
6. To improve students' academic writing skills through structured writing of research proposals and literature reviews.
7. To teach students how to effectively present their research proposals in both written and oral formats, focusing on clarity, coherence, and academic rigor.

Course Outcomes:

By the end of the course, students will be able to:

CO1. Clearly define a research topic, articulate its scope, and formulate appropriate research questions or hypotheses.

CO2. Identify gaps in existing research and understanding the importance of addressing these gaps in their studies.

CO3. Conduct a comprehensive literature review, including searching for relevant sources, evaluating their credibility, and synthesizing information into a coherent review.

CO4. Prepare a detailed research project proposal, demonstrating understanding of its various components, such as objectives, methodology, and expected outcomes.

CO5. Develop a clear and effective research methodology that aligns with their research objectives and is appropriate for their study.

CO6. Enhance their academic writing skills, enabling them to produce well-structured and coherent research proposals and literature reviews.

CO7. To present their research proposals effectively, both in written format and oral presentations, demonstrating clarity, coherence, and academic rigor.

Standard Operating Procedure (SOP) and Guidelines for Research Project:

1. The research project spans across Semester III (4 credits) and Semester IV (6 credits), comprising a total of 10 credits. This is a single, continuous research project divided into two parts over the two semesters of the PG program.
2. The research project must be completed under the supervision and guidance of an in-house research mentor.
3. In Semester III, students are required to present their plan of work and conduct a literature review related to their project.
4. The actual research work will be conducted during Semester IV.
5. The department may organize necessary lectures, workshops, and laboratory training exercises as part of the research project.
6. Students may undertake the research project individually or in groups of up to three members, selecting relevant research topics in consultation with their dissertation supervisor.
7. Supervisors will assist students in reading research articles relevant to selected research topic and guide them in selecting a topic for their dissertation project.
8. With the guidance of their supervisors, students will discuss the research objectives, approach, methodology, data collection methods, and other critical aspects of their project.

9. Students are expected to prepare a comprehensive proposal in a scientific format for their dissertation project.
10. A printed copy of the project proposal must be submitted for internal assessment.
11. Students must also prepare a PowerPoint presentation of their project proposal for the final evaluation.
12. Building on the project proposal from the previous semester, students will plan and engage in an independent and thorough investigation of their chosen research topic.
13. Students may engage in activities such as surveys, interviews, field observations, or experiments to achieve their research objectives.
14. Midway through the semester, students will present their preliminary findings to an internal examiner. Feedback from this session should be incorporated into the final analysis and report.
15. At the conclusion of the dissertation project, students will write a thesis that includes the aim, methodology, results, discussion, and future implications of their research.
16. Students must adhere to ethical principles and standards throughout all stages of their research.
17. A printed and hardbound copy of the dissertation thesis must be submitted for internal assessment.
18. Additionally, students will prepare a PowerPoint presentation of their dissertation thesis for the oral presentation during the Viva-voce, as part of the external evaluation.
19. For the external assessment, students must submit the final report and participate in a viva-voce.
20. The Project Report must be duly signed by the supervisor and the Head of the Department before being submitted to the concerned department.

The final Research Project thesis shall be presented in accordance with the followingspecifications whenever necessary:

(a) The paper used for printing shall be of A4 size.

(b) Printing shall be in a standardized form on both sides of the paper and in 1.5 line spacing.

(c) A margin of 1.5 inches shall be on the left-hand side.

(d) The card for cover shall not be more than 330 GSM.

(e) The title of the thesis/dissertation, name of the candidate, degree, name of the Research Supervisor, place of research and the month and year of submission shall be printed on the title page and the front cover. The name of the Co-supervisor, if any, may be mentioned on the title page and the front cover.

(f) Use the standard referencing style for bibliography/references as per the discipline.

(g) The hard-bound cover of the thesis/dissertation shall be of black color.

Topics and Learning Points

UNIT 1: Title Framing	**Teaching Hours**
1.1 Define research topic	**20**
1.2 Scope of research topic	
1.3 Research questions/Hypothesis	
1.4 Identifying Research Gap	
1.5 Introduction to the problem	
UNIT 2: Literature Review	**40**
2.1Search for Relevant Literature	
2.2Evaluate and Select Sources	
2.3Analyze and Synthesize the Information	
2.4Develop a Structure for Your Review	
2.5Write the Literature Review	
UNIT 3: Preparation of Research Project Proposal	**40**
3.1 Introduction	
3.2 Literature Review	
3.3 Study area	
3.4Objectives	
3.5 Hypothesis	
3.6Methodology	
3.7Significance of the Study	
3.8 Expected Outcomes	
3.9Chapter Scheme	

3.10Timeline (Plan of work)

3.11 Bibliography

UNIT 4: Submission of research project proposal and presentation **20**

4.1 Submission of print copy of research project proposal

4.2 Presentation of the proposal

References:

1. Gomez, B., & Jones III, J. P. (Eds.). (2010). Research methods in geography: A critical introduction (Vol. 6). John Wiley & Sons.
2. Gomez, B., & Jones, J. P. III (2010). Research Methods in Geography: A Critical Introduction.John Wiley and Sons.
3. Goudie, A. (Ed) (2004): Encyclopaedia of Geomorphology, Routledge, London.
4. Gregory, D., Johnston, R., Pratt, G., Watts, M. &Whatmore, S. (2009). The Dictionary of Human Geography. Singapore: Wiley-Blackwell.
5. Hay, I. (2000). Qualitative research methods in Human Geography.
6. Montello, D. and Sutton, P. (2013). An Introduction to Scientific Research Methods in Geography and Environmental Studies. SAGE Publications.
7. Warf, B. (Ed)(2006). Encyclopaedia of Human Geography. London: SAGE Publications.
8. Kothari, C.R. (2004): Research Methodology: Methods and Techniques, New Age International (P) Ltd.,New Delhi – 110002.
9. Kothari, C.R., (1984): Quantitative Techniques, 2nd ed., New Delhi: VikasPublishing House Pvt. Ltd.
10. Mishra Shanti Bhushan and Shashi A. (2011): Handbook of Research Methodology,Educreation Publishing, New Delhi – 110075
11. Pandey, P. and Pandey, M.M. (2015): Research Methodology: Tools and Techniques, , Romania, European Union.

Mapping of Program Outcomes with Course Outcomes

Weightage: 0= No relation, 1= Weak relation, 2= Moderate relation, 3= Strong relation

(COs)/(POs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	1	3	3	3	2	2	1	1
CO2	3	2	2	1	1	2	3	2	0	0
CO3	3	3	1	1	1	3	3	2	0	3
CO4	3	3	1	3	3	3	3	3	1	1
CO5	3	3	2	1	3	3	3	3	0	0
CO6	2	2	1	3	1	2	2	1	0	1

Brief Justification for Ratings

PO1: Comprehensive Knowledge and Understanding

CO1, CO3, CO4, and CO5: These COs focus on defining a research topic, conducting literature reviews, and developing a research proposal, which demonstrate thorough knowledge of research procedures and methodology.

CO2: Identifying research gaps showcases an understanding of emerging developments in the field.

PO2: Application of Knowledge and Skills

CO1, CO4, and CO5: These COs demonstrate the application of technical and theoretical knowledge in formulating research questions and developing research methodologies.

CO3: Applying knowledge in literature review is a critical skill for analyzing data and understanding research trends.

PO3: Constitutional, Humanistic, Ethical, and Moral Values

CO5: Developing a clear and effective research methodology should include ethical considerations, ensuring unbiased research practices.

CO2: Identifying gaps and addressing them responsibly involves ethical reasoning in the choice of research topics.

PO4: Employability and Job-Ready Skills, and Entrepreneurship Skills

CO1, CO4, and CO7: These COs enhance employability through the ability to define a research scope, create proposals, and present research effectively, all of which are critical skills in the job market.

CO6: Strong academic writing skills are essential for producing high-quality reports and publications in a professional setting.

PO5: Autonomy, Responsibility, and Accountability

CO1 and CO4: Defining research topics and preparing project proposals require a high degree of independence, responsibility, and accountability in research practices.

CO5: Developing appropriate research methodologies ensures responsible and accountable academic work.

PO6: Research Skills

CO1, CO3, CO4, and CO5: These COs directly relate to research skills, from defining a topic and reviewing literature to preparing research proposals and developing methodologies, which are central to effective research.

PO7: Critical and Creative Thinking

CO2, CO3, and CO5: Identifying research gaps, synthesizing information from literature, and developing methodologies require critical and creative thinking to approach problems innovatively and construct sound arguments.

PO8: Problem-Solving Abilities

CO4 and CO5: Preparing a detailed research proposal and developing methodologies involve problem-solving abilities to address complex research challenges.

PO9: Collaboration and Teamwork

CO7: Presenting research proposals, both written and oral, often involves collaboration and teamwork, especially in group discussions or joint research projects.

PO10: Digital and Technological Skills

CO3 and CO7: Conducting literature reviews requires proficient use of digital tools for searching and synthesizing information. Presenting research also involves using digital platforms and tools to enhance communication.

CBCS Syllabus as per NEP 2020 for M.A. / M.Sc. II (2023 Pattern)

Name of the Programme : M.A. /M.Sc. Geography
Programme Code : PAGEO
Class : M.A. /M.Sc. II
Semester : III
Course Type : Skill Development
Course Code : GEO-631-SDC
Course Title : Fundamentals of Computer Geography
No. of Credits : 02
No. of Teaching Hours : 30

Course Objectives:

1. To understand the fundamental concepts and scope of computer geography.
2. To appreciate the significance of computer geography in modern geographic analysis.
3. To explore various applications of computer geography in real-world scenarios.
4. To grasp the core principles, components, and functionality of Geographic Information Systems (GIS).
5. To learn the workflow processes involved in GIS, including data collection, management, and analysis.
6. To apply GIS concepts to practical problems and understand its real-world applications.
7. To develop skills in comprehensive document and data management using Microsoft Word, Excel, and PowerPoint.

Course Outcomes:

By the end of the course, students will be able to:

CO1: Demonstrate an understanding of the fundamental concepts and scope of computer geography, including its purpose and importance.

CO2: Articulate the significance of computer geography in enhancing geographic analysis and decision-making processes.

CO3: Identify and analyze real-world applications of computer geography across different sectors and fields.

CO4: Explain the core principles, components, and functionalities of Geographic Information Systems (GIS), and their role in spatial data analysis.

CO5: Outline and execute the GIS workflow, including steps for data collection, management, and spatial analysis.

CO6: Apply GIS concepts to solve practical problems and address real-world issues using GIS technology.

CO7: Utilize Microsoft Word, Excel, and PowerPoint for effective document creation, data analysis, and presentation design.

Topics and Learning Points

Unit 1: Introduction to Computer Geography

1.1 Introduction to the Computer Geography

1.2 Importance of Computer Geography

1.3 Applications of the Computer Geography

Unit 2: Basic Geographic Information Systems GIS Concepts

2.1 GIS Concepts: Fundamental Concepts, Components, and Functionality

2.2 GIS Workflow

2.3 Applications of GIS.

Unit 3: Comprehensive Document and Data Management

3.1 Microsoft Word: Document Creation and Management

3.2 Microsoft Excel: Data Analysis and Visualization

3.3 Microsoft PowerPoint: Presentation Design and Integration

References:

1. Kang-Tsung Chang, Introduction to Geographic Information Systems, McGraw-Hill Education.
2. Chris Brunsdon and Lex Comber, Computer Applications in Geography, Routledge.
3. Paul A. Longley, Michael F. Goodchild, David J. Maguire, and David W. Rhind, Geographic Information Systems and Science, Wiley.
4. V. K. Gupta, Geographical Information Systems: Concepts and Applications, APH Publishing.
5. B. R. Bhatia, Introduction to Geographical Information Systems, Kalyani Publishers.
6. S. S. Chhabra, Microsoft Office 365: The Complete Guide, BPB Publications.

Mapping of Program Outcomes with Course Outcomes

Weightage: 0= No relation, 1= Weak relation , 2= Moderate relation, 3= Strong relation

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	2	1	1	2	1	1	2
CO2	3	3	1	2	1	2	2	2	1	2
CO3	3	3	1	3	1	3	3	3	2	3
CO4	3	3	1	2	1	2	2	2	1	3
CO5	3	3	1	3	2	3	3	3	2	3
CO6	3	3	1	3	3	3	3	3	3	3
CO7	2	2	1	3	2	2	2	2	3	3

Justification for CO-PO Mapping

PO1: Comprehensive Knowledge and Understanding

CO1, CO2, CO3, CO4, CO5, and CO6 have strong connections with PO1, as they contribute significantly to building a thorough understanding of computer geography, including GIS principles and applications. CO7 also supports this by enhancing knowledge through the use of digital tools, albeit to a lesser degree.

PO2: Application of Knowledge and Skills

CO2, CO3, CO4, CO5, and CO6 strongly align with PO2, as they emphasize the application of computer geography concepts and GIS technology in real-world scenarios. CO7 moderately supports this through the practical use of Microsoft tools, while CO1 provides foundational knowledge application.

PO3: Constitutional, Humanistic, Ethical, and Moral Values

COs generally have a weak connection to PO3, as the focus is primarily on technical skills and knowledge. However, an understanding of ethical practices can be indirectly linked through the responsible use of GIS and data management, particularly in CO2 and CO6.

PO4: Employability and Job-ready Skills

CO3, CO5, CO6, and CO7 have strong connections with PO4, as they equip students with practical, job-ready skills in GIS technology and digital tools. CO1 and CO2 contribute moderately by laying the groundwork for these skills.

PO5: Autonomy, Responsibility, and Accountability

CO6 shows a strong connection to PO5 by emphasizing independence and responsibility in applying GIS concepts. CO5 and CO7 also contribute by encouraging accountability in workflow execution and tool usage, while CO1 to CO4 have weaker connections as they focus more on knowledge acquisition.

PO6: Research Skills

CO3, CO5, and CO6 are strongly related to PO6, as they involve analyzing and solving real-world problems using GIS, enhancing research capabilities. CO2 and CO4 moderately contribute by providing a conceptual understanding that supports research, while CO1 and CO7 have a weaker connection.

PO7: Critical and Creative Thinking

CO3, CO5, and CO6 strongly align with PO7 by fostering analytical and creative approaches to problem-solving using GIS technology. CO2 and CO4 moderately contribute through the critical evaluation of concepts, while CO1 and CO7 have a more limited impact.

PO8: Problem-solving Abilities

CO3, CO5, and CO6 have strong connections with PO8, as they focus on identifying and addressing real-world challenges using GIS. CO2 and CO4 moderately support problem-solving through conceptual understanding, while CO1 and CO7 are less directly related.

PO9: Collaboration and Teamwork

CO6 and CO7 have strong connections to PO9, as they involve collaborative efforts in applying GIS concepts and using digital tools. CO3 also supports teamwork in real-world applications, while other COs have a weaker connection.

PO10: Digital and Technological Skills

CO3, CO5, CO6, and CO7 strongly align with PO10, as they involve extensive use of GIS technology and digital tools like Microsoft Office. CO4 moderately contributes through the understanding of GIS functionalities, while CO1 and CO2 provide foundational support for digital skills.