Anekant Education Society's
Tuljaram Chaturchand College, Baramati

Autonomous College

Two Years Degree Programme in Geography

(Faculty of Science and Technology)

Revised Syllabus for

MA/MSc. Geography Part-II Semester III

For Tuljaram Chaturchand College, Baramati

Choice Based Credit System Syllabus

To be implemented from Academic Year 2020-2021

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

Preamble

Introduction:

Tuljaram Chaturchand College has decided to change the syllabi of various faculties from June, 2019. Taking into consideration the rapid changes in science and technology and new approaches in different areas of Geography and related subjects, Board of Studies in Geography after a thorough discussion with the teachers of Geography from different colleges affiliated to the Tuljaram Chaturchand College, Baramati - Pune has prepared the syllabus of M.Sc./M. A. Semester - I and Geography course under the Choice Based Credit System (CBCS). The model curriculum as developed by U.G.C. is used as a guideline for the present syllabi.

Aims and Objectives of the new curriculum:

i) To maintain updated curriculum.

ii) To take care of fast development in the knowledge of Geography.

iii) To enhance the quality and standards of Geography Education.

iv) To provide a broad common frame work, for exchange, mobility and free dialogue across the Indian Geography and associated community.

v) To create and aptitude for Geography in those students who show a promise for higher studies and creative work in Geography.

vi) To create confidence in others, for equipping themselves with that part of Geography which is needed for various branches of Sciences or Humanities in which they have aptitude for higher studies and original work.

Learning Outcomes:

i) Ability of Problem Analysis: Student will be able to analyses 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.

ii) Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

iii) Application of modern instruments: Students will be able to learn the application of various modern instruments and by these; they will be able to collect primary data.

iv) Application of GIS and modern Geographical Map Making Techniques: They will learn how to prepare map based on GIS by using the modern geographical map-making techniques.

v) Examine social and environmental processes, with a particular focus on space and place, critical theory, practical application, analysis and intervention in chosen field within the discipline of Geography

vi) Development of Observation Power: As a student of Geography Course, 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.

vii) 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. Some of the students are being able to understand and write effective reports and design credentials, make effective demonstrations, and give and receive clear instructions.

viii) A geographer has better job opportunities in government departments, Cartographer, Researcher, Teacher/Professor, Competitive Examinations, Government employer, GIS specialist, Climatologist, Transportation Manager, Surveyor, GPS Surveyors.

M.A II - 2020-21

Workload: Four Periods per week per batch (12 Students per batch)

M.A. / M.Sc.- II			
Semester	**One set of the following according to specialization from CCTP***		
III	GEO:5301	Tropical Geomorphology	04
	GEO:5302	Practical in Geomorphology	04
	OR		
	GEO:5303	Urban Geography	04
	GEO:5304	Practical in Population and Settlement Geography	04
		Compulsory Papers	
	GEO:5305	Geoinformatics-II	04
	GEO:5306	Geographical Thoughts	04
	GEO:5307	Practical in Geoinformatics	04
	GEO:5308	Watershed Management	04
	RP: 01	Combine Projects	04
	CC:03	Certificate Course	02

- **Objectives:**
  1) To enable the students to use various scale and projections used to crate maps.
  2) To acquaint the students with basic of statistical data.
  3)
- **Outcome:**

  After study this paper students can able to identify any map scale and projection. They can also know which projection is suitable for given region.

- **Pattern of Examination:**

  Internal : 40 % Marks
  External : 60 % Marks

Semester – IV

	Core Compulsory Theory Paper (CCTP)	Choice Based Optional Paper (CBOP)	Theory / Practical	Credit	Core Compulsory Practical Paper (CCPP)	Credit
GEO-5401	Geography of India	-	-	-	-	04
GEO-5402	Oceanography	-	-	-	-	04
GEO-5403	Research Methodology	-	-	-	-	04
		GEO-5404	Geography of Soils			04
		GEO- 5405	Interpretation of Topographical Maps			04
				GEO-5406	Research Project	04
Total Credits of Semester - IV						**24**

Syllabus (from June, 2020)

M.A. /M.Sc. Geography II SEM III

Course: GEO : 5301 Tropical Geomorphology

No. ofCredits: 04 **No. of Periods:** 64

Course Objectives:

1. Identify and describe the characteristic landforms found in tropical regions, such as mountains, valleys, plains, plateaus, and coastal features.
2. Explore the influence of tropical climates on geomorphic processes, including weathering, erosion, and sedimentation.
3. Analyze the development of karst landscapes, including sinkholes, caves, and limestone formations, in tropical environments.
4. To study the denudation process in tropical regions
5. Explore the development of erosional landforms in tropical regions.
6. Investigate mass wasting events, such as landslides and soil erosion, in tropical landscapes
7. Evaluate the potential impacts of climate change on denudation rates and associated geomorphic processes in tropical regions.

Course Outcomes:

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

- CO1. Understand characteristic landforms found in tropical regions
- CO2. Tropical climates significantly influence geomorphic processes, shaping the landscape through weathering, erosion, and sedimentation.
- CO3. Understand the different karst landscapes, including sinkholes, caves, and lime stone formations, in tropical environments.
- CO4. Understand the denudation process in tropical regions
- CO5. Understand the denudation process in tropical regions.
- CO6. Explore specific examples of mass wasting events: Investigate notable landslides and soil erosion incidents in tropical regions, considering their causes, impacts, and aftermath.
- CO7. This evaluation provides a comprehensive understanding of the potential consequences of climate change on denudation rates and associated geomorphic processes in tropical regions.

Topics and Learning points

Unit – 1: Introduction to Tropics **06**

1.1Tropical Environment –Definition
1.2Peculiarities of tropicalclimate
1.3Classification ofTropics
1.4Morphogenetic regions - Temperature,rainfall, humidity,vegetation

Unit – 2: Tropical Weathering **12**

2.1 Factors influencing the weathering - climatic, geomorphic, biotic, geologic, chronologicaland sitefactors

2.2 Solubility and Mobility of minerals inTropics
2.3 Weathering profile: Deep weathering profiles - nature, development and distribution
2.4 Tropical Soils: Process of soil formation in Tropics, Clay minerals

Unit – 3 :Duricursts and Laterites

3.1 Duricursts and Laterites – Definition
3.2 Indurated laterites - Properties andworld distribution
3.3Classification by site, Morphology and chronology
3.4 A complete account of various divisionof Lateritic Profile
3.5 Landform development on laterites
3.6 Distribution of laterites inIndia
3.7Theories of origin of iron inlaterites

Unit – 4 :Denudation in Tropics **08**

4.1Mass movement: Types &Processes
4.2Slope wash
4.3Process of chemicaldenudation
4.4Tropical rivers- process of erosion and deposition

Unit – 5 :Tropical Landscape **08**

5.1Tropical Terrain – Reliefcharacteristics
5.2 Slope and valleyforms
5.3 Domed and boulderinselbergs
5.4 Hillslopes andPediments
5.5 Tropical coasts

Unit – 6 :Tropical Planation **08**

6.1Formation and Types ofplanation surfaces
6.2Morphology of planationsurfaces
6.3Peneplains, Pedi plains, Etch plains
6.4double surface of planation

Unit – 7 :Landform development in the tropics **08**

7.1Role of tectonics and climaticchange
7.2Nature of changes during Quaternary changes in climate and vegetation

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 UniversityPress.
4. Douglas j. & Spencer, (1985): Environmental change & Tropical geomorphology, George Allen &Unwin.
5. FeniranA. 7 Jeje L.K. (1983): Humid tropicalgeomorphology
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.

Mapping of Program Outcomes with Course Outcomes

Class: MA/MSc-II **Subject:** Geography
Course: Tropical Geomorphology **Course Code:** GEO 5301

Weightage: 1= weak or low relation, 2= moderate or partial relation, 3= strong or direct relation

	Programme Outcomes (POs)							
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1				3				
CO 2				3				
CO 3				3				
CO 4	2			3				
CO 5	2			2				
CO 6	2	2					2	
CO 7	2							

Justification for the mapping

PO1: Research-Related Skills and Scientific temper

Course outcome Co4, Co5, Co6 and Co7 are contributes to identifying research-related skills promote a holistic understanding of denudation processes in tropical regions, emphasizing critical thinking, objectivity, interdisciplinary collaboration, and a scientific temper that values empirical evidence and methodological rigor.

PO2: Effective Citizenship and Ethics

CO3 requires students to acquire effective citizenship in the context of tropical geomorphology involves taking responsibility for how tropical climates influence geomorphic processes aligns with effective citizenship by empowering individuals to actively contribute to environmental sustainability, natural hazard mitigation, climate change advocacy, cultural and biodiversity preservation, and the prevention of environmental injustice.

PO4: Disciplinary Knowledge

CO1, CO2, CO3, CO4, CO5 contribute to the development of students' disciplinary knowledge in oceanography. These outcomes draw on interdisciplinary knowledge, integrating principles from geomorphology, climatology, karst geology, speleology, soil science, environmental science, and hydrology. This interdisciplinary approach is essential for gaining a comprehensive understanding of the characteristic landforms, processes, and environmental dynamics in tropical regions.

PO7: Environment and Sustainability:

CO6 contribute to the knowledge of and need for sustainable development. For example, CO2 requires students to investigating mass wasting events in tropical regions aligns with environmental awareness and sustainability by providing valuable insights for informed decision-making, promoting sustainable practices, enhancing community resilience, and safeguarding ecosystems against the adverse effects of landslides and soil erosion. This knowledge is fundamental for achieving a balance between human activities and the preservation of natural environments in the face of global environmental challenges.

M.A. /M.Sc. Geography II SEM IV
Subject: GEO: 5302 Practical in Geomorphology

No. of Credits: 04 **No. of Periods**: 64

Course Objectives:

1. Develop students' ability to observe and document landforms in their natural settings.
2. Train students in collecting relevant data for geomorphic analysis.
3. Improve students' skills in reading and interpreting topographic maps
4. Familiarize students with laboratory techniques for analyzing soil and sediment samples.
5. Understand the concept of sorting in sedimentology.
6. Enhance skills in field sketching to represent landforms and geological features accurately.
7. Learn to identify and locate hill slopes of varying gradients and aspects on a map.

Course Outcomes:

By the end of the course, students will be able to:
CO1. Students will exhibit improved skills in systematically observing and identifying various landforms in their natural environments.
CO2. Familiarize students with a range of data collection techniques used in geomorphology, including field surveys, remote sensing, and laboratory analyses.
CO3. skills in reading and interpreting topographic maps.
CO4. Understand laboratory techniques for analyzing soil and sediment samples.
CO5. students will have gained a comprehensive understanding of the concept of sorting in sedimentology.
CO6. students will enhance their field sketching skills, enabling them to accurately document geological features and landforms.
CO7. students will identifying and locating hill slopes on topographic maps.

Topics and Learning points

Unit – 1: Geomorphological mapping **04**

(Use of symbols (Hert, 1986)
1.1 Chart showing symbols
1.2 Preparing a geographic map of a small area / basin –toposheets /field
1.3 Interpretation of the map in terms of forms and processes

Unit – 2: Hill slope Analysis **04**

Direct and indirect measurements
2.1 Using clinometers / profiles from toposheets,
2.2 Identification ofsegments
2.3 Dalrymple et al's nine- unit land surface model- Understanding nature of processes

Unit – 3: Field Survey **07**

Channel cross sections/ Beach/Hill slope profile Soil/sediment sample collection
3.1 Surveying and plotting of stream orgully channel cross–section or beach profile or slope profile.
3.2 Quadrat or Traverse surveyof sediment size on riverbedbeach.

3.3 Analysis of shape and size of coarse sediment (Zinggs classification)
GPS survey Preparation of beach, river channel map set c. using GPS

Unit – 4: Laboratory work **05**

Soil/Sediment analysis
4.1 Analysis of 1 sandy and1 Clayey sample
4.2 Plotting of data on probability graphpaperand
4.3 Estimation of grainsizeparameters
4.4 Interpretation ofresults

(Note : Fieldwork / Field Visit for a duration of not more than 5 days should be undertaken for the course selected)

Reference Books:

1. Aackombe, R. V. and Gardiner, V. (1983): Geomorphological FieldManual
2. Chorley, R. J., Schumm, S. A. and Sugden, D.E. (1984) : Geomorphology,Methuen, London
3. Goudie, A. (1990): Geomorphological Techniques, Unwin Hyman,London
4. Hart, M. G. (1986): Geomorphology, Pune and Applied George AllenandUnwin
5. Kale, V. S. and Gupta, A. (2001): Introduction to Geomorphology, OrientLongman, Culcutta
6. King, C.A.M. (1966): Techniques in Geomorphology, EdwardArnold,London
George Allen and Unwin,London

Choice Based Credit System Syllabus

Mapping of Program Outcomes with Course Outcomes

Class: MA/MSc-II **Subject:** Geography
Course: Practical in Geomorphology **Course Code:** GEO 5302

Weightage: 1= weak or low relation, 2= moderate or partial relation, 3= strong or direct relation

	Programme Outcomes (POs)							
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1				3				
CO 2				3				
CO 3				3				
CO 4	2			3				
CO 5	2			2				
CO 6	2	2						
CO 7	2							

Justification for the mapping

PO1: Research-Related Skills and Scientific temper

Course outcome Co4, Co5, Co6 and Co7 are contributes to identifying research-related skills promote a holistic understanding of denudation processes in tropical regions, emphasizing critical thinking, objectivity, interdisciplinary collaboration, and a scientific temper that values empirical evidence and methodological rigor.

PO2: Effective Citizenship and Ethics

CO3 requires students to acquire effective citizenship in the context of practical geomorphology involves enhancing field sketching skills in documenting geological features and landforms aligns with effective citizenship by empowering individuals to actively contribute to environmental advocacy, community engagement, environmental education, the preservation of geological heritage, and scientific integrity.

PO4: Disciplinary Knowledge

CO1, CO2, CO3, CO4, CO5 contribute to the development of students' disciplinary knowledge in Geomorphology. These course outcomes collectively contribute to the development of students' disciplinary knowledge in geomorphology. The outcomes cover key aspects of landform recognition, data collection techniques, map interpretation, laboratory analysis, and sediment logical concepts. This comprehensive approach ensures that students are well-prepared to engage in research and practical applications within the field of geomorphology.

M.A. /M.Sc. Geography II SEM IV

Subject: GEO : 5303 Urban Geography

No. of Credits: 04 **No. of Periods:** 64

Course Objectives:

1. Understand the processes of urbanization, including historical context.
2. Develop skills in analyzing and interpreting spatial patterns within urban areas, including land use, housing patterns.
3. Explore the economic functions of cities, examining the role of various industries, employment patterns, and the impact of globalization on urban economies.
4. Gain a fundamental understanding of key concepts in urban morphology, including land use, street patterns, building types, and the relationship between form and function.
5. students will gain a nuanced understanding of the historical development of urban forms.
6. Understand the role of transportation systems and infrastructure in shaping urban accessibility, connectivity.
7. Investigate demographic trends in urban areas, including population dynamics, migration patterns, age structure, and the social implications of demographic changes.

Course Outcomes:

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

CO1. Students should gain an awareness of the historical context of urbanization, recognizing key milestones and transitions in the development of urban areas over time.

CO2. Students will be equipped with the skills and knowledge necessary to critically analyze and interpret spatial patterns within urban areas.

CO3. Students will gain a comprehensive understanding of the economic dynamics of cities, preparing them to contribute to informed discussions on urban economic development.

CO4. Understand the ability to classify and analyze different land uses within urban areas, distinguishing between residential, commercial, industrial, and recreational zones.

CO5. Students will gain a understanding of the historical development of urban forms

CO6. students will be well-equipped to contribute to the planning and development of transportation systems that enhance urban accessibility.

CO7. students will be well-prepared to contribute to informed discussions on demographic trends in urban areas and to participate in the development of policies

Topics and Learning points

Unit – 1: Introduction to Urban Geography **07**

1.1 Nature of Urban Geography
1.2 Scope of Urban Geography
1.3 Significance of Urban Geography
1.4 Relation to other disciplines

Unit – 2: Urbanization **07**

2.1 Meaning of Urban settlementand urbanization.
2.2 Brief review of spatial- temporal variations in urbanization in the world
2.3 Urbanizationcurve
2.4 Contemporary factors of urbanization

Unit – 3: Urban Morphology **07**

Models of urban structure:
3.1 Park and BurgessModel
31.2 Homer Hoyet Model
31.3 Harris and UllmanModel
3.4 Characteristics and demarcation of CBD

Unit – 4: Urban Classification **04**
4.1 Criteria used forclassification
4.2 Functional classification of towns and cities

Unit –5: Urban Demography **08**
Characteristics of urban population:
5.1 Growth of Urbanpopulation
51.2 Density of population incities
5.3 Age, sex and occupational structure

Unit –6: City and its Region **04**
6.1 Concepts of city region andvarious synonymous termsused
6.2 Criteria used to demarcate the city region

Unit –7: Central Place **08**
7.1 Christallers Central Place Theory
7.2 Rank-size relationship and rank- sizerule
7.3 Hierarchy of urban settlements

Unit –8: Contemporary Urban issues **08**
8.1 Price of land and vertical and horizontal growth ofcities
8.2 Scarcity of housing and growth ofslums
8.3 Problems of civicamenities
8.4 Urban transportproblem
8.5 Urban Environmental pollution

Unit –9: Urban policy and planning **07**
9.1 Urban development policy in India
9.2 Need &Element of cityplan
9.3 Use of GIS in Urban Planning

Reference Books:

1. Bhattacharya: Urban Development in India, Shree publication
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: Urban Geography
9. Roy Turner: Indian's UrbanFuture
10. R.B Mandal-V.G A Textbook (Concept publishingCompany
11. Shah Manzooor Alam: Urbanization in Developing Countries
12. Singh.K.and Steinberg.F. (eds)(1998): Urban India in Crisis. New AgeInterns

Choice Based Credit System Syllabus

Mapping of Program Outcomes with Course Outcomes

Class: MA/MSc-II **Subject:** Geography
Course: Urban Geography **Course Code:** GEO 5303

Weightage: 1= weak or low relation, 2= moderate or partial relation, 3= strong or direct relation

	Programme Outcomes (POs) Urban Geography							
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1				2				
CO 2				2				
CO 3				2				
CO 4	2			3				
CO 5				2				
CO 6				2				
CO 7		2						

Justification for the mapping

PO1: Research-Related Skills and Scientific temper

Course outcome Co4 contributes to identifying research-related skills promote a holistic understanding of the ability to classify and analyze different land uses within urban areas requires a combination of research-related skills and a scientific temper. This involves systematic data collection, proficiency in GIS technology, understanding of regulations, interdisciplinary knowledge, predictive modeling, and effective communication

.

PO2: Effective Citizenship and Ethics

Co7 requires students to acquire effective citizenship in the context of being well-prepared to contribute to informed discussions on demographic trends in urban areas and participating in policy development enhances students' capacity for effective citizenship and ethical engagement. These skills empower individuals to actively contribute to the well-being of their communities, advocate for just and equitable policies, and consider the

broader ethical implications of their actions in the context of urban dynamics.

PO4: Disciplinary Knowledge

CO1, CO2, CO3, CO4, CO5 and Co6 are contributing to the development of students' disciplinary knowledge. Each course outcome represents a specific area of disciplinary knowledge in the broader field of urban studies and planning. The justification for each outcome lies in the importance of these knowledge areas for preparing students to address contemporary urban challenges, make informed decisions, and contribute meaningfully to the development and sustainability of urban areas.

M.A. /M.Sc. Geography II SEM IV

Subject: GEO : 5304 Practical in Population and Settlement Geography

No. of Credits: 04 **No. of Periods**: 64

Course Objectives:

1. Develop skills in collecting and analyzing demographic and settlement data.
2. Enhance proficiency in mapping techniques and spatial analysis related to population and settlement patterns.
3. Apply theoretical knowledge to real-world case studies of population dynamics and settlement patterns.
4. Gain practical experience through field visits to observe population and settlement characteristics.
5. Engage with local communities to understand their demographic and settlement needs.
6. Learn the process of population projection using demographic data.
7. Explore principles of settlement planning and design.

Course Outcomes:

By the end of the course, students will be able to:
CO1. Students should be able to design surveys, gather relevant data, and utilize statistical methods to analyze and interpret population and settlement data.
CO2. Students should be able to create thematic maps, utilize Geographic Information Systems (GIS), and conduct spatial analyses to understand the spatial distribution of populations and settlements.
CO3. Students should be able to critically analyze case studies, identify key demographic and settlement trends.
CO4. Students should develop observational skills, document spatial patterns, and analyze on-site data to complement classroom learning.
CO5. Students should be able to design and conduct community surveys, interviews, and focus group discussions to gather qualitative data.
CO6. Students should be able to apply demographic methods to project future population trends and understand the implications for settlement planning.
CO7. Students should be able to design hypothetical settlements considering factors such as land use, infrastructure.

Topics and Learning points

Unit – 1: Population Geography **06**

Demographic indices:

1.1 Mean age at marriage andfertility

1.2 Measures of mortality, IMR&A.S.D.R Dependency ratio

Determinants of Demographic transition:

1.1 Demographic transition-appliedto Maharashtra
(birth rate and death rate)

1.2 Pull-push factors affecting volume of migration-
simple correlation matrix

1.3 Rural urban composition of population

Unit – 2: Settlement Geography **06**

2.1 Gravity model by W.J. Reilly and Zipf, its application (potential populationsurfaces)
Indices of C.B.D

2.2 Stages according to urbanization curve
2.3 Rank sizerule
2.4 Ginis Coefficient concentration index

Unit – 3: Village Survey/ Urban Survey **08**

3.1 Preparation ofquestionnaire
3.2 Collection of Population and settlementdata
3.3 Data analysis and preparation ofreport

Reference Books:

1. Economic and Political weekly-Special issue of populationsurvey
2. Liendzore J.M Techniques in HumanGeography
3. Martin Cad: Analytical UrbanGeography
4. Siddharth,K and Mukherjee,S (1999): Cities urbanization and urbansystems
5. Chandana,R,.C.Population,Geography
6. Yeats,M.H.(1978): An introduction to quantitative analysis in humanGeography.
7. Carter Harold: UrbanGeography
8. John R.Weeks: Population – an introduction to concepts andissues.

Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: MA/MSc-II **Subject:** Geography
Course: Practical in Population Geography **Course Code:** GEO : 5304

Weightage: 1= weak or low relation, 2= moderate or partial relation, 3= strong or direct relation

	Programme Outcomes (POs)							
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1				2				
CO 2				2				
CO 3	2			2				
CO 4				3				
CO 5	2			2				
CO 6		2		2				
CO 7				2				

Justification for the mapping

PO1: Research-Related Skills and Scientific temper

Course outcome Co3 and Co5 CO3 emphasizes research-related skills and a scientific temper by requiring students to critically analyze case studies, identify demographic and settlement trends, and design and conduct community surveys, interviews, and focus group discussions. These skills not only contribute to students' proficiency in research methodologies but also instill a scientific mindset characterized by objectivity, critical thinking, and ethical research practices. This combination of skills and temper is essential for conducting meaningful research and contributing to evidence-based decision-making in the field of urban studies and community development.

PO2: Effective Citizenship and Ethic

CO6 contributing to the development of students' Effective Citizenship and Ethics. the process of population projection using demographic data enhances effective citizenship by providing individuals with the knowledge

and tools to actively engage in community development, advocate for social justice, and contribute to informed decision-making. Additionally, it aligns with ethical principles by promoting responsible and forward-thinking citizenship that considers the well-being of both current and future generations.

PO4: Disciplinary Knowledge

CO1, CO2, CO3, CO4, CO5 and Co6, Co7 are contributing to the development of students' disciplinary knowledge. each course outcome represents a specific aspect of disciplinary knowledge necessary for students to excel in the field of urban studies and demographic analysis. Together, these outcomes cover a wide spectrum of skills and knowledge, ensuring that students are well-equipped to address the complexities of population and settlement dynamics and contribute meaningfully to the field.

M.A. /M.Sc. Geography II SEM IV
Subject: GEO : 5305 Geoinfoematics II

No. of Credits: 04 **No. of Periods:** 64

Course Objectives:

1. Introduce students to the fundamental concepts of remote sensing.
2. Explain the fundamentals of electromagnetic radiation (EMR), the electromagnetic spectrum, and spectral signatures.
3. Define and differentiate types of platforms used in remote sensing.
4. Explain the principles and differences between across-track and along-track scanning sensors.
5. Understand the concept of spatial resolution.
6. Introduce the basic principles, types, and steps of image interpretation.
7. students gain a comprehensive understanding of the fundamental principles, technologies, and applications in the field of remote sensing.

Course Outcomes:

By the end of the course, students will be able to:
CO1. Students should understand the definition of remote sensing, the underlying principles, and the conceptual framework of acquiring information from a distance.
CO2. Students should comprehend the effects of atmospheric conditions on remote sensing data acquisition.
CO3. Students should be able to identify various platforms and understand their characteristics.
CO4. Students should be able to differentiate between these scanning mechanisms and understand their applications.
CO5. Students should understand the concept of spatial resolution and its importance in image interpretation.
CO6. Students should be able to apply fundamental principles and techniques to interpret remote sensing images.
CO7. Students should understanding of the fundamental principles, technologies, and applications in the field of remote sensing.

Topics and Learning Points:

Unit – 1: Introduction to Remote Sensing **05**

1.1 Remote Sensing: definition, conceptand principles
1.2 History and development of Remote Sensing in India

Unit – 2: EMR and EMS **10**

2.1 EM Radiation, EM Spectrum, Spectral Signature
2.2 Interaction of EMR withatmosphere
2.3 Interaction of EMR with Earth's surface
2.4 Black body radiation, Laws of radiation

Unit – 3: Platforms and Satellites **15**

3.1 Platform: Types andcharacteristics
3.2 Satellites: Geo-stationary and Sun synchronous
3.3 Earth Resources Satellites:LANDSAT,
SPOT, IRS, IKONOS satellite series
3.4 Meteorological satellites: INSAT, NOAA, GOES

Unit – 4: Sensors **08**

4.1 Sensors: Across track (whiskbroom) and along track (push broom) scanning
4.2 Optical mechanical scanners: MSS, TM, LISS,
WiFS, PAN

Unit – 5: Resolution **05**

5.1 SpatialResolution
5.2 SpectralResolution
5.3Resolution
5.4 Radiometric Resolution

Unit –6: Image Interpretation Techniques **05**

6.1 Basic principles, types, stepsand elements of imageinterpretation
6.2 Techniques of visual interpretation and interpretation keys

Unit – 7: Aerial Photography **12**

7.1 Aerial camera:Components
7.2 Aerial Photography: Definitionand characteristics
7.3 Types of aerial photographs Types of Aerial Photographs Based on the Position of the Cameral Axis
7.4 Types of Aerial Photographs Based onScale
7.5 Geometry of an aerialphotograph

Reference Books:

1. Anji Reddy, M. (2004): Geoinformatics for environmental management. B.S.Publications
2. Campbell, J.B. (2002): Introduction to Remote sensing. TaylorPublications.
3. Chang.T.K. (2002): Geographic Information Systems. Tata Mc Graw Hill
4. Drury, S.A. (1987): Image Interpretation in Geology. Allen andUnwin.
5. Francis Tar Bernhardsen. Geographical Information Systems. JohnWiley.
6. Gupta, R.P. (1990): Remote Sensing Geology. Springer Verlag.
7. Heywood.I, Cornelius S, Crver Steve. (2003): An Introduction to Geographical Information Systems. PearsonEducation
8. Jensen, J.R. (2000): Remote Sensing of the Environment: An Earth resourcePerspective Prentice Hall.
9. Joseph George (2003): Fundamentals of remote sensing. UniversitiesPress.
10. Lillesand, T.M., and Kieffer, R.M. (1987): Remote Sensing and Image Interpretation,John Wiley.
11. Ram Mohan Rao. (2002): Geographical Information Systems. Rawat Publication.
12. Sabbins, F.F. (1985): Remote sensing Principles and interpretation. W.H. Freemanand company
13. Skidmore A., (2002): Environmental modeling with GIS and Remote Sensing. Taylorand
14. Wise S., (2002): GIS Basics. Taylor Publications

Mapping of Program Outcomes with Course Outcomes

Class: MA/MSc-II **Subject:** Geography
Course: Geoinfoematics II **Course Code:** GEO 5305
Weightage: 1= weak or low relation, 2= moderate or partial relation, 3= strong or direct relation

	Programme Outcomes (POs)							
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1				2				
CO 2				2				
CO 3				2				
CO 4				3				
CO 5	2			2				
CO 6	2			2				
CO 7	2							

Justification for the mapping

PO1: Research-Related Skills and Scientific temper

Course outcome Co5, Co6, Co7 are contributes to identifying research-related skills. CO5-CO7 emphasizes research-related skills and a scientific temper by focusing on spatial resolution, image interpretation, and remote sensing. These outcomes equip students with the skills and mindset needed to engage in rigorous research, analyze spatial data, and apply remote sensing technologies with scientific integrity.

PO4: Disciplinary Knowledge

CO1, CO2, CO3, CO4, CO5 and Co6 are contributing to the development of students disciplinary knowledge. the disciplinary knowledge justification for CO1-CO7 lies in the comprehensive coverage of essential concepts and principles in remote sensing. These outcomes ensure that students develop a robust foundation, allowing them to navigate the complexities of acquiring, processing, and interpreting remote sensing data across various applications and scenarios.

M.A. /M.Sc. Geography II SEM IV
Subject: GEO: 5306 Geographical Thoughts

No. of Credits: 04 **No. of Periods:** 64

Course Objectives:

1. Examine the contributions of Greek scholars to the development of physical and mathematical geography.
2. Compare and contrast systematic and regional approaches in geography.
3. Explore different paradigms that have shaped geographical thought.
4. Explore the conceptual developments in geographical thought.
5. Explore humanistic and welfare approaches in geography.
6. Define applied geography and explore its significance.
7. Explore the connection between geography and public policy.

Course Outcomes:

By the end of the course, students will be able to:
CO1. Students should understand the foundational concepts introduced by Greek thinkers in geography.
CO2. Students should be able to differentiate between determinism and possibilism and recognize their implications.
CO3. Students should be familiar with various paradigms and their influence on geographical theories.
CO4. Students should understand the key concepts of areal differentiation, regional synthesis, locational and spatial analysis, and system analysis.
CO5. Students should understand the humanistic and welfare perspectives in geographical studies.
CO6. Students should understand the practical applications of geography and its relevance in addressing real-world issues.
CO7. Students should understand how geographical knowledge contributes to the formulation and implementation of public policies.

Topics and Learning Points:

Unit –1: Historical Development of Geographical Thought **20**

1.1 Greek contribution to Physicaland MathematicalGeography.
1.2 Roman: Contributions of Strabo, Ptolemy
1.3 Arab School: Contribution of AlBattani, Al Masudi, IbnKhaldun.
1.4 Contributions of Explorers and itsimpact
1.5 Contributions of Varenius and E. Kant
1.6 A brief account of differentschools:
a) German: Ratzel, Humboldt
b) French: Vidal de La blache, Jean Brunhes
c) British: H. Mackinder, H.Fleure:
d) American: Carl O Sauer, E.Huntington
1.7 Indian Schools of thoughts

Unit –2: Dualism in Geography **06**

2.1 Determinism and Possibilism

2.2 Systematic versus Regional Geography
2.3 Physical versus Human Geography

Unit –3: Paradigms, approaches and Models in Geography **08**

3.1 Paradigms in Geography
3.2 Evolutionary approach and its impact on Geography
3.3 Types of Models used inGeographical Studies

Unit –4: A) Conceptual Development
B) MajorRevolutions: Theirimpacts **12**

4.1 Areal Differentiation, RegionalSynthesis, Locational and Spatial Analysis, System analysis.
4.2 Quantitative Revolution, Behavioural Revolution, Geo-informatics revolution: Their impacts

Unit –5: Trends in Geography **08**

5.1 Humanistic and WelfareGeography
5.2 MarxistGeography,
5.3 RadicalGeography,
5.4 Geography ofGender

Unit –6: Applied Geography **06**

6.1 Applied Geography: Definition, meaning and Significance; Examples
Geography and Public Policy

Reference Books:

1. Cooke, R. U. and Doornkamp, J. C. (1974): Geomorphology in Environmental Management, Clarendon Press,Oxford.
2. Coffey, W. J. (1981): Geography : Towards a general spatial systems approach, Mathuen, London
3. Dikshit, R. D. (1997): Geographical Thought: A Contextual History of Ideas, Pub. ByA.
4. Frazire, J. W. (1982): Applied Geography, Prentice Hall, EnglewoodCliffs.
5. Hertshone, R. (1959): Perspectives of Nature of Geography, Rand Mac Nally andCo.
6. Hussain, M. (1995) : Evolution of Geographical Thought, Rawat Pub.,Jaipur
7. Singh I. (2006): Diverse aspect of Geographical Thought, ALFA Publications, NewDelhi

Choice Based Credit System Syllabus

Mapping of Program Outcomes with Course Outcomes

Class: MA/MSc-II **Subject:** Geography
Course: Geographical Thoughts **Course Code:** GEO 5306

Weightage: 1= weak or low relation, 2= moderate or partial relation, 3= strong or direct relation

	Programme Outcomes (POs)							
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1				2				
CO 2				2				
CO 3	2			2				
CO 4	2			2				
CO 5				2				
CO 6		2						
CO 7		2		2				

Justification for the mapping

PO1: Research-Related Skills and Scientific temper

Course outcome Co3 and Co4 contributes to identifying research-related skills. Students will not only grasp fundamental geographical concepts but also develop the skills necessary for effective research and contribute to the scientific understanding of geographic phenomena.

PO2: Effective Citizenship and Ethics

Co6 and Co7 requires students to acquire effective citizenship in the context of being well-prepared to contribute to these learning outcomes not only equip students with the practical applications of geography but also instill a sense of responsibility, ethical considerations, and active citizenship. By understanding how geographical knowledge can be applied to real-world issues and policy development, students are prepared to make meaningful contributions to society.

PO4: Disciplinary Knowledge

CO1, CO2, CO3, CO4, CO5 and Co7 are contributing to the development of students' disciplinary knowledge. Each course outcome contributes to a well-rounded understanding of geography as a discipline, encompassing historical foundations, theoretical frameworks, analytical tools, human perspectives, practical applications, and policy relevance. This disciplinary knowledge equips students to engage critically with the complexities of the geographical world.

M.A. /M.Sc. Geography II SEM IV
Subject: GEO : 5307 Practical in Geoinformatics

No. of Credits: 04 **No. of Periods:** 64

Course Objectives:

1. Introduce the concept of scale and height measurement using a parallax bar in aerial photography.
2. Develop skills in visually interpreting satellite images from sensors such as LISS, PAN, and WiFS.
3. Introduce raster data structure and methods of layer generation using full grid, chain codes, and run length codes.
4. Explore spatial interpolation techniques using data from a toposheet quadrant.
5. Introduce vector data structure and discuss manual digitization, digitization errors, and topology building.
6. Familiarize students with the interpretation of satellite data from Cartosat, IKONOS, and Quick Bird.
7. Introduce raster data structure and methods of layer generation using full grid, chain codes, and run length codes.

Course Outcomes:

By the end of the course, students will be able to:
CO1. Students should understand how to determine scale and height from aerial photographs using a parallax bar.
CO2. Students should be able to identify and interpret features from different spectral bands in satellite imagery.
CO3. Students should be able to create raster layers and understand encoding methods.
CO4. Students should be able to apply spatial interpolation methods to estimate values in areas lacking data.
CO5. Students should be proficient in manual digitization, identify and manage digitization errors, and build topological relationships.
CO6. Students should develop critical thinking skills through the interpretation and analysis of remote sensing and GIS data
CO7. The course aims to integrate theoretical knowledge with practical skills

Topics and Learning Points:

Unit – 1: Aerial Photography **02**
Measurements and Interpretation
1.1 Scale and height (using parallax bar)
1.2 Visual Interpretation of singleaerial photograph
1.3 Interpretation of stereo pair using Stereoscope

Unit –2: Satellite Images **02**
2.1 Visual interpretation of LISS, PAN, WiFS
2.2 Cartosat Data, IKONOS and Quick Bird

Unit – 3: Spatial Database **04**
LayerGeneration
3.1 Raster: Full Grid, Chain Codes andRun LengthCodes
3.2 Vector: Manual Digitization, Digitization Errors and Topology Building

Unit – 4: GIS Operations **02**
4.1 Raster and vector overlay, map algebra (AND, OR) from a toposheet quadrant

4.2 Spatial interpolation from a toposheet quadrant

Reference Books:

1. Burrough, P.A. and R.A. McDonnell (2000): Principles of GeographicalInformation System, Oxford UniversityPress.
2. Chang Kang-tsung. (2002): Introduction to GIS, Tata McGraw Hill, NewDelhi.
3. C. P. Lo and Albert, K. W. Yeung (2002): Concepts and Techniques of Geographic Information System, 2002Prentice –Hall,India.
4. George Joseph (2003): Fundamentals of Remote Sensing, Universities Press,Hyderabad
5. Kang – Tsung – Chang, (2002): Introduction to Geographical InformationSystem, McGraw Hill.
6. J. R. Jensen, (2003) : Remote Sensing of Environment, An Earth ResourcePerspective, Pearson Education Pvt. Ltd., NewDelhi
7. P. A. Burrough and R. A. McDonnell, (2000): Principles of Geographical Information System, Oxford UniversityPress.
8. Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D.W. Rhind (2002):Introduction to Geographic Information Systems and Science, John Wiley and SonsLtd.
9. Vaidyanadhan, R. (1973): Index to a set of 70 aerial stereopairs, UGC, NewDelhi.

Choice Based Credit System Syllabus

Mapping of Program Outcomes with Course Outcomes

Class: MA/MSc-II **Subject:** Geography

Course: Practical in Geoinformatics **Course Code:** GEO 5307

Weightage: 1= weak or low relation, 2= moderate or partial relation, 3= strong or direct relation

	Programme Outcomes (POs)							
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1				2				
CO 2	2			2				
CO 3				2				
CO 4	2			2				
CO 5				2				
CO 6			2					
CO 7			2					

Justification for the mapping

PO1: Research-Related Skills and Scientific temper

Course outcome Co2 and Co4 are contributes to identifying research-related skills. These learning outcomes not only equip students with practical skills in remote sensing and spatial analysis but also foster a scientific temper by encouraging critical thinking, hypothesis testing, and an awareness of the uncertainties inherent in geographical research. The combination of technical proficiency and a scientific mindset prepares students to engage in sophisticated research and analysis within the field of geography.

PO3: Social Competence and Communication Skills

CO6 and Co7 require students to acquire effective citizenship. These learning outcomes emphasize the importance of collaborative learning, effective communication, and t these learning outcomes emphasize the importance of collaborative learning, effective communication, and the ability to apply theoretical knowledge in practical contexts. These skills are crucial not only for the successful interpretation and analysis of remote sensing and GIS data but also for preparing students for effective engagement in professional and research settings within the field of geography.

PO4: Disciplinary Knowledge

CO1, CO2, CO3, CO4, CO5 contribute to the development of students' disciplinary knowledge in Geoinformatics. These learning outcomes align closely with foundational concepts and skills within geography, emphasizing key principles in photogrammetry, remote sensing, GIS, spatial analysis, and data management.

M.A. /M.Sc. Geography II SEM IV
Subject: GEO : 5308 Watershed Management

No. of Credits: 04 **No. of Periods: 64**

Course Objectives:

1. Introduce the fundamental concepts of watershed, watershed management, and the principles guiding effective management.
2. To learn the process of delineating a watershed.
3. Study the key hydrological processes occurring within a watershed.
4. Introduce water conservation methods and structures used in watershed management.
5. Highlight the use of remote sensing and GIS in watershed management.
6. Explore the formulation and implementation of integrated watershed development plans.
7. Understand the broader significance of watershed management in national development.

Course Outcomes:

By the end of the course, students will be able to:
CO1. Students should understand the definition of a watershed, the concept of watershed management, and the principles underlying successful watershed management.
CO2. Students should be able to delineate a watershed using appropriate methods and tools.
CO3. Students should have a comprehensive understanding of the hydrological cycle and its significance in watershed management.
CO4. Students should understand the design, construction, and benefits of water conservation structures.
CO5. Students should be proficient in applying remote sensing and GIS techniques for assessing and managing watersheds.
CO6. Students should be able to develop comprehensive plans for integrated watershed management.
CO7. Students should appreciate the role of watershed management in contributing to overall national development goals.

Topics and Learning Points:

Unit – 1: Concept of watershed management **06**

1.1 Definition, concepts of watershed; watershed management, Principle of watershed management

1.2 Necessity of watershed management
Problems in watershed management

Unit – 2: Characteristics of watershed **06**

2.1 Delineation ofWatershed

2.2 Characteristics: Size , Shape , Physiography, Climate, Drainage,
Land use, Vegetation, Geology and Soils, Hydrology, Socioeconomics

Unit – 3: Hydrological process in watershed **06**

3.1 Precipitation, interception, infiltration, evaporation, evapo-transpiration, surface runoff, ground water-flow, water budget

3.2 Hydrological cycle

Unit – 4: Water and soil conservation in watershed **06**

4.1 Water conservation: Nala Bunding, Check dams, Farm ponds, Percolation tanks, Artificial recharge

4.2 Soil conservation- Contour Bunding, Gully plugging, Trench cum mound, Levelling

Unit – 5: Watershed development **06**

5.1 Application of Remote Sensing and GIS in watershed management

5.2 Integrated watershed developmentplans

5.3 Importance of watershed management in nationaldevelopment.

Reference Books:

1. Dhruvanarayana, V.V., Sastry, G., Patnaik, U.S.: Watershed Management
2. Kakde, B.K.: Watershed Manual – A Guide for Watershed Development Practitioners and Trainers, BAIF Development Research Foundation,Pune.
3. Murthy, JVS: Watershed Management, New age International Publishers.
4. Rajesh Rajora: Integrated Watershed Management- A Field Manual for Equitable, Productive and Sustainable Development, Rawat Publication, Jaipur.
5. Singh Rajvir: Watershed Planning and Management, 2nd Edition, Yash Publishing House, Bikaner,India.
6. Suresh,R.: Soil and Watershed Conversation Engineering, 2nd Edition, Standard Publication Distributors,Delhi.
7. Schwab,G.O. et al: Soil and Water Conservation Engineering, 4th Edition, John Wiley & Sons.

Choice Based Credit System Syllabus

Mapping of Program Outcomes with Course Outcomes

Class: MA/MSc-II **Subject:** Geography
Course: Watershed Management **Course Code:** GEO 5308

Weightage: 1= weak or low relation, 2= moderate or partial relation, 3= strong or direct relation

	Programme Outcomes (POs)							
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 1				2			2	
CO 2				3				
CO 3				3				
CO 4				2			2	
CO 5	2			2				
CO 6		2		2			2	
CO 7							2	

Justification for the mapping

PO1: Research-Related Skills and Scientific temper

Co5 contributes to identifying research-related skills promote developing proficiency in applying remote sensing and GIS techniques for watershed assessment requires a strong foundation in research-related skills and a scientific temper. This involves the ability to collect, integrate, and analyze spatial data, collaborate across disciplines, formulate and test hypotheses, critically evaluate data, consider ethical implications, and embrace a mindset of continuous learning. These skills collectively prepare students for effective and responsible engagement in watershed research and management.

PO2: Effective Citizenship and Ethics

CO6 requires students to acquire effective citizenship in the context of watershed management involves taking responsibility for development of comprehensive plans for integrated watershed management requires students to embrace effective citizenship and ethics. This involves engaging with diverse stakeholders, considering social justice and equity, practicing environmental stewardship, complying with legal and regulatory frameworks, ensuring transparency and

accountability, and planning for long-term sustainability. These skills and ethical considerations are essential for responsible and impactful watershed management practices.

PO4: Disciplinary Knowledge

CO1, CO2, CO3, CO4, CO5 and Co6 are contributing to the development of students' disciplinary knowledge in watershed management. These learning outcomes demonstrate the interdisciplinary nature of watershed management within the field of geography. They integrate principles from hydrology, geomorphology, environmental science, engineering, and spatial analysis to provide students with a comprehensive understanding of watershed dynamics and the skills needed for effective management and conservation.

PO7: Environment and Sustainability:

CO1, Co4, Co6 and Co7 contribute to the knowledge of and need for sustainable development. The stated learning outcomes emphasize the integration of environment and sustainability principles within watershed management education. By understanding watersheds, designing water conservation structures, developing comprehensive plans, and appreciating the role of watershed management in national development, students are equipped to contribute to environmentally sustainable practices and promote the responsible use of natural resources.