Anekant Education Society's

Tuljaram Chaturchand College of Arts, Science and Commerce, Baramati

(Autonomous)

Two Year Degree Program in Geography

(Faculty of Science & Technology)

Syllabus for

M.A. /M.Sc. Geography Part-I SEM - II

Choice Based Credit System Syllabus

To be implemented from Academic Year 2019-2020

(2019 Pattern)

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

Introduction:

Tuljaram Chaturchand College has announced updates to the syllabi across various faculties, effective June 2022. In response to the rapid advancements in science and technology, as well as new methodologies in Geography and related disciplines, the Board of Studies in Geography at Tuljaram Chaturchand College, Baramati - Pune, has developed a new syllabus for the M.Sc./M.A. Semester-I Geography courses under the Choice Based Credit System (CBCS). This updated curriculum follows the model guidelines established by the U.G.C.

Pursuing a Master's degree in Geography equips students with the knowledge and skills necessary for a wide range of fulfilling careers. Geographers can find opportunities as urban planners, GIS technicians and analysts, disaster preparedness planners, educators, environmental scientists, remote sensing analysts, transportation planners, demographers, hydrologists, and more.

The Master's program will allow students to explore the spatial organization of physical features and human activities at various scales, from local to global. Students will learn to identify geographical features, understand their locations, and analyze similarities and differences among places. They will also study human-environment interactions and how both physical and cultural landscapes evolve over time. Those focusing on physical geography will gain insights into the processes that shape Earth’s climate, landforms, and the distribution of flora and fauna. In contrast, students concentrating on human geography will analyze cultural phenomena such as population dynamics, development, agriculture, language, and religion.

Aims and Objectives of the New Curriculum:

1. **To Maintain an Updated Curriculum:**

   Ensure that the syllabus reflects current trends and advancements in the field of Geography.

2. **To Address Rapid Developments in Geographic Knowledge:**

   Incorporate the latest research and technological advancements to keep pace with the evolving discipline.

3. **To Enhance the Quality and Standards of Geography Education:**

   Improve the overall educational experience and outcomes for students studying Geography.

4. **To Provide a Broad Framework for Exchange and Dialogue:**

   Foster collaboration and communication within the Indian Geography community and related fields, facilitating academic mobility.

5. **To Cultivate an Aptitude for Geography Among Promising Students:**

   Encourage those with potential for advanced study and creative contributions in Geography.

6. **To Instill Confidence for Further Exploration:**

   Equip students with the necessary geographic knowledge applicable to various scientific and humanitarian disciplines, supporting their aspirations for higher studies and original research.

Programme Outcomes (POs) for M.A. Geography:

1. **Research-Related Skills and Scientific Temper:**
   Develop the ability to analyze scientific literature, formulate and test hypotheses, and identify relevant sources for research. Acquire skills to plan and write research papers while emphasizing academic integrity, research ethics, intellectual property rights, and plagiarism issues.
2. **Effective Citizenship and Ethics:**
   Demonstrate a commitment to social equity and national development, acting with awareness of moral and ethical issues while adhering to professional ethics and responsibilities.
3. **Social Competence and Communication Skills:**
   Show the ability to consider diverse viewpoints and present complex ideas clearly in both written and oral formats. Communicate effectively using appropriate media, fostering interactive skills to meet global competencies and facilitate group conclusions.
4. **Disciplinary Knowledge:**
   Exhibit comprehensive knowledge and a strong theoretical foundation in the field of Geography.
5. **Personal and Professional Competence:**
   Function independently and collaboratively within a team to achieve objectives across interdisciplinary fields. Cultivate interpersonal skills, self-motivation, adaptability, and a commitment to professional ethics.
6. **Self-Directed and Life-Long Learning:**
   Embrace a mindset of lifelong learning, pursuing self-determined goals within the context of socio-technological changes and engaging in independent, ongoing education.
7. **Environment and Sustainability:**
   Understand the societal and environmental implications of scientific solutions and recognize the importance of sustainable development.
8. **Critical Thinking and Problem Solving:**
   Identify and analyze problems by examining surrounding situations holistically, generating viable solutions. Demonstrate critical thinking skills by evaluating scientific texts and themes, applying analytical and lateral thinking to design effective solutions.

Tuljaram Chaturchand College, of Arts, Science and Commerce Baramati

(Autonomous)

Board of Studies in Geography

From 2019-20 To 2021-22

Sr. No.	Name of Member	Designation
1.	**Dr. Asaram S. Jadhav** Head & Assistant Professor, Department of Geography, T. C. College, Baramati.	Chairman
2.	**Dr. Arun S. Magar,** Assistant Professor, Department of Geography, T. C. College, Baramati	Internal Member
3.	**Mr. V. H. Madane** Assistant Professor, Department of Geography, T. C. College, Baramati	Internal Member
4.	**Mr. Vinayak D. Chavan** Assistant Professor, Department of Geography, T. C. College, Baramati	Internal Member
5.	**Mr. Prashant A. Shinde** Assistant Professor, Department of Geography, T. C. College, Baramati	Internal Member
6.	**Ms. Nayan D. Zagade** Assistant Professor, Department of Geography, T. C. College, Baramati	Internal Member
7.	**Dr. Amit Dhorade** Professor, Department of Geography, Savitribai Phule Pune University, Pune.	External Member Vice-Chancellor Nominee
8.	**Dr. Avinash Kadam** Associate Professor, Department of Earth Science, Sant Gadagebaba University, Nanded	External Member from other University
9.	**Dr. T. P. Shinde** Head & Associate Professor, Dept. of Geography, Mudhoji College, Phaltan	External Member from other University
10.	**Dr. Ramesh Nanware** President, Geo- Solution PVT. LTD. Pune	Industrialist

11.	**Dr. Jawahar L. Chaudhari** Associate Professor, Department of Geography, M. S. Kakade College, Someshwarnagar, Baramati.	Meritorious Alumni

Semester – I

Sr. No.	Course Code	Core Compulsory Theory Paper (CCTP)	Choice Based Optional Paper (CBOP)	Core Compulsory Practical Paper (CCPP)	Credit
1	GEO-4101	Principles of Geomorphology	-	-	04
2	GEO- 4102	Principles of Climatology	-	-	04
3	GEO-4103	Principles of Economic Geography	-	-	04
4	GEO- 4104	Principles of Population and Settlement Geography	-	-	04
5	GEO- 4105	-	-	Practical in Physical an Geography	04
6	GEO- 4106	-	-	Practical in Human Geography	04
				Total Credits	**24**

Semester – II

Sr. No.	Course Code	Core Compulsory Theory Paper (CCTP)	Choice Based Optional Paper (CBOP)	Theory / Practical	Credit	Core Compulsory Practical Paper (CCPP)	Credit
1	GEO- 4211	Geoinformatics - I					04
	One of the following according to specialization from CCTP						
2	GEO-4201	Coastal Geomorphology	-	-	04	-	04
	GEO-4204	Population Geography	-	-	04	-	
	One of the following according to specialization from CCTP						
3	GEO-4202	Fluvial Geomorphology	-	-	04	-	04
	GEO-4205	Geography of Rural Settlements	-	-	04	-	
	Optional Paper (CBOP) (1 Theory + 1 Practical)						
4		Give 4	GEO-4212	Geography of Disaster Management	04		04
			GEO-4213	Practical in Surveying	04		04
	Core Compulsory Practical Paper (CCPP)						
5						GEO-4214 Practical of Statistical Techniques for Geography	04
		Total Credits of Semester - II					**24**

Semester – III

Course Code	Core Compulsory Theory Paper (CCTP)	Choice Based Optional Paper (CBOP)	Theory / Practical	Credit	Core Compulsory Practical Paper (CCPP)	Credit
GEO-5311	Geoinformatics-II	-	-	04	-	04
GEO-5312	Geographical Thoughts	-	-	04	-	04
One of the following according to specialization from CCTP						
GEO-5301	Tropical Geomorphology	-	-	04	-	04
GEO-5304	Urban Geography	-	-	04	-	04
Choice Based Optional Paper (CBOP) (1Theory + 1Practical)						
		GEO-5313	Practical in Geoinformatics	04	-	04
		GEO-5314	Watershed Management	04	-	04
One of the following according to specialization from CCPP						
				GEO-5302	Practical in Geomorphology	04
				GEO-5305	Practical in Population and Settlement Geography	04
					Total Credits of Semester -III	**24**

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	Biogeography	-	-	-	-	04
Choice Based Optional Paper (CBOP) (1Theory + 1Practical)						
		GEO-5411	Geography of Soils	04		08
		GEO-5412	Geostatistics	04		
		GEO-5413	Political Geography	04		
		GEO-5414	Regional Planning	04		
		GEO-5415	Tourism Geography	04		
		GEO-5416	Social Geography	02		
		GEO-5417	Interpretation of Topographical Maps & Village Survey / Project work	04		
Core Compulsory Practical Paper (CCPP)						
				GEO-5406	Dissertation / Research Project	04
				Total Credits of Semester - IV		**24**

Mandatory 12 additional/ add-on credits for Post Graduate Programmes

Note:

1. 6 credits from Group - 1 are compulsory

2. Choose minimum 6 credits from Group - 2 to Group - 7

Group-1	Human Rights Awareness Course (Semester-I):		02 credit
	Cyber Security Awareness Course (Semester-I)		02 credit
	Cyber Security Awareness Course (Semester-II)		02 credit
Group-2 Skill Component Courses	1. Subject Related Certificate Course (Sem. II) 2. Subject Related skill development courses (Sem. III) 3. Subject Related skill development courses (Sem. IV)		02 credits 02 credits 02 credits
Group-3	(a)	Representation in Sports at University Level	02 credits
	(b)	Representation in Sports at State Level / National level	02 credits
	(c)	Representation in Sports at International (overseas) Level	04 credits
Group-4	(a)	Selection in AVISHKAR at University Level	02 credits
Group-5	(a)	Research paper publication at National level	02 credits
	(b)	Research paper publication at International (overseas) level	02 credits
Group-6	(a)	Participation in Summer School/ Internship programme / Short term course (not less than 2 weeks duration)	02 credits
Group-7	(a)	Participation in cultural and co curricular activities/ extracurricular activities/competitions at University level / State Level	02 credit
	(b)	Participation in cultural and cocurricular activities / extracurricular activities/ competitions at International (overseas) level	02 credits

Note : 1) One Credit = 15 Lectures.

2) The Project should be initiated at on the onset of III Semester and submitted during IV

Semester.

3) FY/SY --> 4 Lectures per week.

4) Theory paper be covered with 70% actual teaching (3 actual lectures per week) and 30%

Component (1 lecture per week) of self-study should be further evaluated through Group

Discussion / Seminar / Open Book Test / MCQ / Essay writing / Assignment etc.

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Tuljaram Chaturchand College of Arts, Science and Commerce, Baramati

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Department of Geography

M.A/M.Sc. Geography Syllabus structure

2019 Pattern

SEM	Course Code	Course title	Course Type	No. of Credits
I	GEO 4101	Principles of Geomorphology	Theory	04
	GEO 4102	Principles of Climatology	Theory	04
	GEO 4103	Principles of Economic Geography	Theory	04
	GEO 4104	Principles of Population and Settlement Geography	Theory	04
	GEO 4105	Practical in Physical Geography	Practical	04
	GEO 4106	Practical in Human Geography	Practical	04
II	GEO 4201	Coastal Geomorphology	Theory	04
	GEO 4202	Fluvial Geomorphology	Theory	04
	GEO 4203	Population Geography	Theory	04
	GEO 4204	Geography of Rural Settlements	Theory	04
	GEO 4211	Geoinformatics - I	Theory	04
	GEO 4212	Geography of Disaster Management	Theory	04
	GEO 4213	Practical in Surveying	Practical	04
	GEO4214	Practical of Statistical Techniques for Geography	Practical	04
III	GEO 5301	Tropical Geomorphology	Theory	04
	GEO 5302	Practical in Geomorphology	Practical	04
	GEO 5303	Urban Geography	Theory	04
	GEO 5304	Practical in Population and Settlement Geography	Practical	04
	GEO 5305	Geoinformatics-II	Theory	04
	GEO 5306	Geographical Thoughts	Theory	04
	GEO 5307	Practical in Geoinformatics	Practical	04
	GEO 5308	Watershed Management	Theory	04

IV	GEO 5401	Geography of India	Theory	04
	GEO 5402	Oceanography	Theory	04
	GEO 5403	Research Methodology	Theory	04
	GEO 5404	Geography of Soil	Theory	04
	GEO 5405	Interpretation of Topographical Maps	Practical	04
	GEO 5406	Research Project	Project	04

M.A./M.Sc. Geography, Syllabus for Semester II

Subject: Coastal Geomorphology

Subject Code: GEO-4201 **No. of Credits:** 04

Course Objectives:

1. To provide a comprehensive understanding of coastal systems and the various components that influence coastal geomorphology.
2. To explore the processes that shape coastal environments, including waves, tides, and currents.
3. To examine the causes and consequences of sea level changes over time.
4. To analyze coastal sediments, their properties, types, and transport mechanisms.
5. To study various coastal environments, focusing on fluvial-dominated and wave-dominated systems.
6. To discuss current issues in applied coastal geomorphology, including hazards and management strategies.
7. To evaluate coastal hazard management practices, policies, and their implications for sustainability.

Course Outcomes:

After completion of this course, students will be able to:

CO 1: Define key concepts related to coastal systems and their components.
CO 2: Analyze the processes of wave, tide, and current dynamics in shaping coastal environments.
CO 3: Understand the implications of sea level changes and their indicators in the geological record.
CO 4: Differentiate between various types of coastal sediments and their transport pathways.
CO 5: Describe the characteristics and formation processes of different coastal environments.
CO 6: Address current coastal issues and propose strategies for management and conservation.
CO 7: Assess the impact of coastal hazards and evaluate resilience and adaptation measures.

Topics and Learning Points

1. **Introduction: Coasts and Coastal Systems and Shore Zones (6 Lectures)**

   1.1 The coastal environment: littoral, shore, coastal zones

1.2 Components of coastal systems

1.3 Spatial and temporal scales in Coastal Geomorphology

1.4 Coastal classification: genetic and morphological

2. **Coastal Processes** **(10 Lectures)**

2.1 Waves: Definition, types, and processes of shoaling

2.2 Tides: Equilibrium theory, types, and implications for coastal landforms

2.3 Currents: Types and dynamics of various coastal currents

3. **Sea Level** **(10 Lectures)**

3.1 Transgression, regression, and causes of sea level change

3.2 Quaternary sea level changes and future projections

3.3 Indicators of former sea levels

4. **Coastal Sediments** **(8 Lectures)**

4.1 Properties and types of coastal sediments

4.2 Sources and transport pathways of sediments

5. **Coastal Environments** **(12 Lectures)**

5.1 Fluvial-dominated: Coastal deltas and estuaries

5.2 Wave-dominated: Beaches, dunes, and biotic environments

6. **Applied Coastal Geomorphology** **(12 Lectures)**

6.1 Current coastal issues:

6.2 Coastal hazard management

Reference Books

1. Bird, E.C. (2000): Coastal Geomorphology: An Introduction, John Wiley and Sons, Chichester.
2. Bloom, A.L. (2002): Geomorphology: A Systematic Analysis of Late Cenozoic Landforms, Prentice-Hall of India, New Delhi.
3. Davis, J.L. (1980): Geographical Variation in Coastal Development, Longman, New York.
4. Goudie, A.S. (Eds.) (2004): Encyclopaedia of Geomorphology, Routledge, London. Ivan, V. (2006): Global Coastal Change, Blackwell Publishing, Oxford. Karlekar, Shrikant (2009): Coastal Processes and Landforms, Diamond Publication, Pune.

5. King, C.A.M. (1972): Beaches and Coasts, Edward Arnold, London. Masselink, G., Hughes, M., and Knight, J. (2011): Introduction to Coastal Processes and Geomorphology, Hodder Education, London.
6. Pethick, J. (1984): An Introduction to Coastal Geomorphology, Arnold-Heinemann, London.
7. Tooley, M. M. and Shennan, I. (1987): Sea Level Changes, Basil Blackwell, Oxford.

Choice Based Credit System Syllabus (2019 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: M.A./MS.c Geography I **Subject:** Geography

Course: Coastal Geomorphology **Course Code:** GEO 4202

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
CO 1				2				
CO 2							3	
CO 3			2			2		
CO 4			2		2			
CO 5								3
CO 6								2
CO 7			2					

Justification for the mapping

PO3: Social competence and communication skill:

CO3- Comprehending synoptic-scale weather patterns and effectively communicating their characteristics, formation, and associated phenomena contributes to social competence by enhancing communication skills, educational outreach, interdisciplinary communication, risk communication, cross-cultural understanding, engagement in public discussions, collaboration in weather-related projects, public service announcements, community resilience building, and fostering empathy and understanding. These skills are vital for effectively communicating weather-related information and fostering informed and resilient communities.

CO4-Interpreting synoptic weather maps, satellite imagery, and meteorological data for weather analysis and prediction enhances social competence and communication skills by fostering effective weather communication, weather education and outreach, engagement in weather discussions, community resilience building, interdisciplinary communication, media and public communication, supporting emergency response, crisis communication, public engagement and empowerment, and promoting environmental awareness. These skills contribute to informed decision-making, public safety, and increased weather literacy among diverse audiences.

CO7- The ability to communicate complex synoptic coastal geomorphology concepts, observations, and analyses effectively through reports and presentations enhances social competence and communication skills by promoting clear and impactful communication, facilitating educational outreach, encouraging interdisciplinary collaboration, supporting professional presentations, aiding in public awareness campaigns, advocating for policy change, engaging communities, engaging with media, empowering decision-making, and promoting environmental advocacy. These skills contribute to informed decision-making, public engagement, and proactive measures in addressing climate-related challenges.

PO4: Disciplinary Knowledge:

CO1- Understanding basic concepts in coastal geomorphology is foundational for disciplinary knowledge as it aids in conceptual understanding, interdisciplinary applications, data interpretation, problem-solving, weather pattern comprehension, forecasting, climate analysis, research, communication, and fosters a drive for continuous Course and specialization in climatology-related fields. These skills are crucial for further academic pursuits and professional development in climatology and related disciplines.

PO5: Personal and professional competence:

CO4- Interpreting synoptic weather maps, satellite imagery, and meteorological data for weather analysis and prediction is essential for providing accurate forecasts, understanding weather systems, identifying trends, monitoring severe weather events, predicting climate variability, supporting various industries like agriculture and aviation, aiding in resource management, facilitating scientific research, and ensuring disaster preparedness. This skill is invaluable for multiple sectors and is critical in ensuring safety, resilience, and efficient planning in the face of changing weather conditions.

PO6: Self directed and Life-long Course:

CO3- Comprehending synoptic-scale weather patterns promotes self-directed and lifelong Course by fostering continuous education, providing foundational knowledge, facilitating adaptability to changing conditions, enhancing problem-solving and critical thinking skills, offering applied Course opportunities, improving forecasting abilities, supporting career development, enhancing communication skills, fostering environmental awareness, and encouraging a lifelong pursuit of knowledge in meteorology and related fields.

PO7: Self directed and Life-long Course:

CO2- Understanding coastal phenomena and their effects is crucial for environmental sustainability. It supports disaster preparedness, climate change awareness, ecosystem health, resource management, renewable energy planning, urban infrastructure resilience, water and food security, coastal and marine conservation, environmental policy development, and community engagement in sustainable practices. This knowledge is essential for fostering a more sustainable and resilient environment for future generations.

PO8: Critical Thinking and problem solving:

CO5- The ability to identify and analyze ocean anomalies and extreme weather events linked to synoptic-scale weather systems enhances critical thinking by honing pattern recognition, data analysis and synthesis, understanding cause-and-effect relationships, fostering problem-solving abilities, enabling risk assessment and management, facilitating complex decision-making, predictive analysis, environmental impact assessment, and promoting continuous improvement in problem-solving approaches. These skills are essential for addressing complex weather-related challenges and devising effective strategies for resilience and adaptation.

CO6-Developing critical thinking skills to analyze and solve complex problems related to synoptic weather systems and their influence on climate variability and change enhances critical thinking by fostering systems thinking, data analysis, pattern recognition, understanding causal relationships, predictive modeling, problem-solving in complexity, evidence-based decision-making, risk assessment, adaptation strategies, and continuous Course. These skills are crucial for comprehending and addressing the complexities of weather-related phenomena and their broader impacts on climate variability and change.

M.A./M.Sc. Geography, Syllabus for Semester II

Subject: Principles of Geomorphology

Subject Code: GEO-4202 **No. of Credits:** 04

Course Objectives:

1. To describe the concept of a drainage basin and stream network.
2. To understand the basic laws and models of the fluvial processes.
3. To discuss characteristics of drainage basin hydrology.
4. To apply quantitative methods to measure and assess fluvial processes and landforms.
5. To analyze the role of fluvial processes in shaping landscapes.
6. To explain the factors influencing the formation and evolution of river channels.
7. To identify the flow types and to measure the velocity of the river flow.

Course Outcomes:

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

1. Accurately describe the concept of a drainage basin and stream network, including their components and interconnectedness.
2. Demonstrate a comprehensive understanding of the basic laws and models of fluvial processes, enabling them to explain and apply them to real-world scenarios.
3. Discuss the characteristics of drainage basin hydrology, including aspects such as precipitation, runoff, and stream flow patterns.
4. Apply quantitative methods to measure and assess fluvial processes and landforms, allowing them to collect and analyze data related to river systems effectively.
5. Analyze the role of fluvial processes in shaping landscapes, including erosion, deposition, and landform evolution.
6. Explain in detail the factors influencing the formation and evolution of river channels, such as sediment transport, channel morphology, and boundary conditions.
7. Identify different flow types within a river system and measure the velocity of the river flow, utilizing appropriate measurement techniques and tools.

Topics and Learning Points

UNIT 1: Introduction to Fluvial Geomorphology **Teaching Hours**

1.1 Definition and scope **12**

1.2 Drainage basin and stream network

1.3 Horton's laws of drainage composition

1.4 Laws of Allometric Growth

1.5 Phases of drainage network development- Glock's model

UNIT 2: Drainage Basin Hydrology **12**

2.1 Runoff generation and types

2.2 Gully and channel formation

2.3 Chanel initiation

2.4 Discharge and magnitude/frequency of flows in river system

UNIT 3: Open Channel Hydraulics **12**

3.1 Types of flows

3.2 Flow behaviour- sub-critical, critical and supercritical flow

3.3 Flow velocity variations and measurement methods

3.4 Shear stress and stream power

UNIT 4: Channel Morphology **12**

4.1 River categories- alluvial, bedrock and mix alluvial-bedrock

4.2 Cross-section morphology and reach morphology

4.3 Controls of channel morphology

4.4 Channel bed configuration

4.5 Channel patterns or plan forms

UNIT 5: Fluvial Erosion, Transportation and Deposition **12**

5.1 Erosion processes and associated landforms

5.2 Transportation processes and types

5.3 Depositional processes and associated landforms

5.4 Importance of fluvial landforms

References:

1. Charlton, R. (2008): Fundamentals of fluvial Geomorphology, Routledge, NewYork.
2. Fryirs, K.A. and Brierley, G.J. (2013): Geomorphic Analysis of River Systems: An approachto reading the landscape,Wiley-Blackwell.
3. Garde, R.J. (2006): River Morphology, New age international limited publishers New Delhi.
4. Kale, V.S. and Gupta, A. (2001): Introduction to Geomorphology, Orient Longman, Kolkata.
5. Knighton, D. (1998): Fluvial forms and processes, Arnold, an imprint of Hodder
6. Education,and Hachette UK Company,London.
7. Kondolf, M.G. and Piegay, H. (2016): Tools in Fluvial Geomorphology,Wiley-Blackwell.
8. Leopold, L.B., Wolman, M.G. and Miller, P. (1954): Fluvial processes in Geomorphology, Freeman and Co.SanFrancisco.
9. Maithi, R. (2016): Modern approaches to Fluvial Geomorphology, PrimusBooks.
10. Mangelsdorf, J., Scheurmann, K. and Weib, F.H. (1989): River Morphology, Springer- Verlag.
11. Morisawa, M. (1985): Rivers: Forms and Processes, Longman,UK.
12. Richards, K. (1982): River: Forms and processes in alluvial channels. Methuen and Co. London.
13. Robert, A. (2003): River Processes: An Introduction to Fluvial Dynamics. Hodder Education, and Hachette UK Company,London.

Mapping of Program Outcomes with Course Outcomes

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			2					
CO 4				3				
CO 5				3				
CO 6					2			

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO 7						2		

Justification for the Mapping

PO 1: Knowledge of Geography:

CO 1: Accurately describing the concept of a drainage basin and stream network enhances knowledge of geographical processes and structures.

PO 2: Effective Citizenship and Ethics:

CO 2: Understanding the laws and models of fluvial processes promotes responsible engagement with environmental issues, fostering awareness of the ethical implications of water management.

PO 3: Social Competence and Communication Skills:

CO 3: Discussing characteristics of drainage basin hydrology supports communication skills through the explanation of complex hydrological concepts to diverse audiences.

PO 4: Disciplinary Knowledge:

CO 1: Comprehensive knowledge of drainage basins contributes to a deeper understanding of hydrological systems within geographical studies.

CO 2: Understanding basic laws of fluvial processes enriches disciplinary knowledge by linking theory to real-world applications.

CO 4: Applying quantitative methods fosters advanced knowledge in analyzing and interpreting geographical data.

PO 5: Critical Thinking and Problem Solving:

CO 5: Analyzing fluvial processes enhances critical thinking by enabling students to assess how these processes shape landscapes and impact human activities.

PO 6: Self-directed and Life-long Learning:

CO 6: Understanding factors influencing river channel evolution encourages self-directed learning by prompting exploration of environmental and geological processes.

PO 7: Research and Analytical Skills:

CO 7: Identifying flow types and measuring river flow velocity enhances analytical skills, equipping students to conduct field research effectively.

M.A./M.Sc. Geography, Syllabus for Semester II

Subject: Geoinformatis

Subject Code: GEO-4211 **No. of Credits:** 04

Course Objectives:

1. To understand the definition and potential of Geographic Information Systems (GIS).
2. To explore the spatial information theory and its relevance in GIS.
3. To analyze the history and objectives of GIS and its applications.
4. To comprehend the types of databases used in GIS, both spatial and non-spatial.
5. To learn about various data models, including geometric primitives and DBMS concepts.
6. To acquire skills in structuring spatial data using different digitizing methods.
7. To develop competencies in data analysis, including attribute and spatial databases.

Course Outcomes:

After completion of this course, students will be able to:

CO 1: Ability to define GIS and articulate its potential in spatial analysis.

CO 2: Proficiency in applying spatial information theory in practical scenarios.

CO 3: Understanding of the historical development and objectives of GIS.

CO 4: Capability to differentiate between spatial and non-spatial databases.

CO 5: Competence in using various data models and understanding their applications in GIS.

CO 6: Skills in structuring and editing spatial data using digitizers.

CO 7: Ability to perform complex data analysis, including algebraic and spatial queries.

Topics and Learning Points

1. Introduction to GIS **(6 Lectures)**

1.1 Definition, potential of GIS, concept of space & time

1.2 Spatial Information Theory

1.3 History of GIS

1.4 Objectives of GIS

1.5 Elements of GIS, hardware & software requirements

1.6 GIS Applications

1.7 GIS Tasks - input, manipulation, management, query & analysis, visualization\

2. Database (6 Lectures)

2.1 Spatial: spatial relationship, functional relationship, logical relationship

2.2 Non-spatial: nominal, ordinal, ratio and cyclic

3. Data Models (12 Lectures)

3.1 Spatial: Geometric primitives, Raster, Vector

3.2 Quad tree tessellation, comparative overview of raster and vector models, layers and coverage

3.3 Non-spatial: DBMS - Advantages, conceptual models

3.4 Implementational models - hierarchical, network and relational

4. Structuring of Spatial Data (12 Lectures)

4.1 Digitizers: manual, semi-automatic & automatic

4.2 Editing error: detection & correction, topology building

5. Data Analysis (I) (12 Lectures)

5.1 Attribute databases: operations from algebraic theory

5.2 Operations from set theory SQL: attribute query

6. Data Analysis (II) (12 Lectures)

6.1 Spatial Databases: map algebra, grid Operations: Local, Focal

6.2 SQL: spatial query

Reference Books

1. Burroughs, P. A. and McDonnell, R.A. (2002): Principles of Geographical Information System, Oxford University Press.
2. George, J. (2004): Fundamentals of Remote Sensing, Universities Press Pvt. Ltd., Hyderabad.
3. Jensen, J. R. (2003): Remote Sensing of Environment, An Earth Resource Perspective, Pearson Education Pvt. Ltd., New Delhi.
4. Kang-Tsung Chang (2002): Introduction to Geographical Information System, McGraw Hill.

5. Lillesand, T. M. and Kiefer, R. W. (2002): Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
6. Lo, C. P. and Yeung, A.K.W. (2002): Concepts and Techniques of Geographic Information System, Prentice Hall, India.
7. Paul A. Longley, Michael F. Goodchild, D. J. Maguire, and D. W. Rhind (2002): Introduction to Geographic Information Systems and Science, John Wiley and Sons Ltd.
8. Fundamentals of Remote Sensing, A Canada Centre for Remote Sensing Remote Sensing Tutorial. Available at: NRCan

Choice Based Credit System Syllabus (2019 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: M.A./MS.c Geography I **Subject:** Geography

Course: Geoinformatics **Course Code:** GEO 4211

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
CO 1				3				
CO 2						2		
CO 3				2				
CO 4		2	2					
CO 5			2					
CO 6						2		
CO 7								3

Justification for the mapping

PO 2: Effective Citizenship and Ethics:

CO4- Understanding ethical and legal considerations associated with geoinformatics cultivates responsible citizenship by promoting ethical behavior, ensuring data integrity, protecting privacy, fostering equitable access to information, and encouraging informed decision-making based on geographic data that respects societal values and rights.

PO 3: Social competence and communication skill:

CO4- Understanding the ethical and legal considerations associated with geoinformatics enhances social competence and communication skills by fostering clear communication, conflict resolution, interdisciplinary collaboration, stakeholder engagement, cultural sensitivity, negotiation abilities, advocacy, empathy, risk communication, and public education initiatives. These skills are essential for effective communication and responsible engagement in the geoinformatics field.

CO5- Exploring and applying geoinformatics tools in various domains contribute to social competence and communication skills by fostering problem-solving abilities, enhancing communication, promoting interdisciplinary collaboration, cultivating cultural sensitivity, engaging stakeholders effectively, improving data visualization, nurturing critical thinking, facilitating public outreach, aiding decision-making, and fostering a global perspective. These skills are valuable for effective communication and engagement across diverse fields and communities.

PO 4: Disciplinary Knowledge:

CO1- Grasping basic concepts in Geoinformatics enriches disciplinary knowledge by fostering spatial understanding, enhancing data analysis skills, facilitating interdisciplinary applications, improving problem-solving abilities, developing technological proficiency, recognizing geospatial data sources, honing visualization techniques, aiding decision-making, supporting impact assessment studies, and fostering research and innovation. These skills are foundational and applicable across numerous academic disciplines and professional fields.

CO3- Creating thematic and location maps enhances disciplinary knowledge by promoting spatial representation, aiding data visualization and analysis, supporting interdisciplinary applications, developing geospatial analysis skills, facilitating research and decision-making, understanding spatial context, aiding communication, supporting planning processes, and guiding fieldwork and data collection efforts. These skills are applicable across various academic disciplines and professional fields reliant on spatial data analysis and interpretation.

PO 6:Self- directed and Life-long Course:

CO2- practical work in GIS software supports self-directed and lifelong Course by enhancing

technical proficiency, data analysis skills, problem-solving abilities, independent exploration, adaptability to new technologies, research capabilities, geospatial problem-solving, interdisciplinary application, professional development, and community engagement. These skills empower individuals to continuously learn, adapt, and apply GIS knowledge across diverse contexts and throughout their lives.

CO6- Gaining proficiency in GIS software for data analysis, mapping, and visualization supports self-directed and lifelong Course by promoting technical skill development, independent exploration, problem-solving abilities, continuous skill enhancement, interdisciplinary application, research opportunities, adaptability to new technologies, professional development, community engagement, and problem-based Course. These skills empower individuals to learn continuously and apply GIS knowledge effectively across various contexts throughout their lives.

PO 8: Critical Thinking and problem solving:

CO7- Developing critical thinking skills in geospatial problem analysis and solution proposal enhances problem-solving abilities by facilitating complex problem deconstruction, data evaluation, pattern recognition, in-depth analysis, evaluation of alternatives, creative problem-solving, evidence-based decision-making, risk assessment, continuous improvement, and effective communication. These skills are crucial for addressing geospatial challenges and finding sustainable solutions in diverse fields of study and professional practice.

M.A./M.Sc. Geography, Syllabus for Semester II

Subject: Population Geography

Subject Code: GEO-4203 **No. of Credits:** 04

Course Objectives:

1. To understand the definitions, nature, and scope of Population Geography.
2. To analyze the distribution and density of population across the world.
3. To explore various population theories and their implications.
4. To examine fertility trends and determinants in India.
5. To investigate mortality concepts and recent trends in the global context.
6. To study migration types, theories, and push-pull factors.
7. To assess population composition and its demographic, social, economic, and cultural aspects.

Course Outcomes:

After completion of this course, students will be able to:

CO1: Define Population Geography and explain its significance in geographical studies.

CO2: Analyze global population distribution and density patterns.

CO3: Evaluate key population theories, including Malthusian and demographic transition models.

CO4: Discuss fertility levels, trends, and their determinants in India.

CO5: Measure and interpret mortality trends and concepts.

CO6: Classify migration types and assess their impacts and determinants.

CO7: Analyze population composition across various dimensions.

Topics and Learning Points

1. Introduction to Population Geography (6 Lectures)

1.1 Definitions

1.2 Nature and scope of Population Geography

1.3 Sources of population data (Census, national sample survey, sample registration survey, NFHS, DLHS)

2. Population Dynamics **(6 Lectures)**

2.1 Population distribution in the world

2.2 Density of population in the world

2.3 Determinants of population growth

3. Population Theory **(12 Lectures)**

3.1 Malthus Theory

3.2 Optimum Population Theory

3.3 Demographic Transition Model

4. Fertility **(12 Lectures)**

4.1 Concepts and measures of Nuptiality and fertility

4.2 Levels and trends of fertility in India

4.3 Determinants of fertility

4.4 Theories of fertility

5. Mortality **(6 Lectures)**

5.1 Concept of mortality & morbidity

5.2 Measures of mortality

5.3 Recent mortality levels in the world

5.4 Mortality trends in India

6. Migration **(12 Lectures)**

6.1 Definition, types (Internal and International)

6.2 Concept: refugee, brain-drain migration

6.3 Determinants and consequences of migration

6.4 Lee's Theory of Migration

6.5 Ravenstein's laws of migration

6.6 Push-pull factors of migration

7. Population Composition **(6 Lectures)**

7.1 Demographic

7.2 Social

7.3 Economic

7.4 Cultural

8. Population Development and Policies (12 Lectures)

8.1 Human Development Index (HDI)

8.2 Gender Development Index (GDI)

8.3 Relation between population and development

8.4 Population policy of India

8.5 New Population policy of China

Reference Books

1. Agarwala, S. N. (1977): India's Population Problems, Tata McGraw Hill Publishing Co. Ltd., New Delhi.
2. Bose, A., et al. (1974): Population in India's Development, Vikas Publishing House, New Delhi.
3. Chandna, R. C. (1986): Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi.
4. Clarke, J. I. (1973): Population Geography, Pergamon Press, Oxford.
5. Clarke, J. I. (Ed.) (1984): Geography and Population: Approaches and Applications, Pergamon Press, Oxford.
6. Crook, Nigel (1997): Principles of Population and Development, Pergamon Press, New York.
7. Garnier, B. J. (1970): Geography of Population, Longman, London.
8. Pathak, K. B., and Ram, F. (1992): Techniques of Demographic Analysis, Himalaya Publishing House, Bombay.
9. Sundaram, K. V., and Nangia, Sudesh (Ed.) (1986): Population Geography, Heritage Publications, Delhi.
10. UNDP (2002): Human Development Report, Oxford.
11. Woods, R. (1970): Population Analysis in Geography, Longman, London.

Choice Based Credit System Syllabus (2019 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: M.A./MS.c Geography I **Subject:** Geography

Course: Population Geography **Course Code:** GEO4203

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
CO 1				2				
CO 2				2		2		
CO 3			2					
CO 4			2					
CO 5				2				
CO 6			3					
CO 7								3

Justification for the mapping

PO3:Social competence and communication skill:

CO3- Understanding the dynamics of population and its role in population policies enhances social competence and communication skills by supporting informed discussions, policy advocacy, community engagement, education and awareness, interdisciplinary communication, policy dialogue, cultural sensitivity, ethical considerations, advocacy for social justice, and professional engagement. These skills are crucial for fostering effective communication and informed decision-making in various social and professional contexts.

CO4- Understanding the worldwide distribution of population enhances social competence and communication skills by fostering cultural awareness, providing global perspectives, aiding in contextualizing global issues, supporting interdisciplinary conversations, crisis awareness, promoting global citizenship, informing policy discussions, cultural sensitivity, and facilitating communication with diverse audiences. This knowledge is crucial for effective communication in an increasingly interconnected and diverse world.

CO6- Understanding population growth rates in different countries enhances social competence and communication skills by fostering cultural sensitivity, providing global perspectives, aiding in cross-cultural communication, understanding socio-economic contexts, informing policy discussions, addressing global challenges, environmental awareness, promoting empathy, crisis awareness, and facilitating professional and academic engagement. This knowledge is crucial for effective communication and engagement in an increasingly interconnected world.

PO4:Disciplinary Knowledge:

CO1- By comprehending population geography, students not only gain a deeper understanding of the world's population dynamics but also develop critical thinking skills applicable across various disciplines. It's a foundation that supports informed decision-making, policy implementation, and a broader understanding of societal changes.

CO2- Understanding these theories equips students with a multidisciplinary perspective, enabling them to analyze complex societal issues and develop comprehensive solutions. It fosters critical thinking, problem-solving skills, and the ability to apply theoretical knowledge to real-world scenarios across various disciplines.

CO5- By comprehending population structure and characteristics, professionals in various fields can make informed decisions, develop tailored policies, and create targeted interventions that address specific societal needs. It serves as a fundamental tool for understanding and addressing challenges across disciplines, ensuring more effective and efficient solutions.

PO6:Self-directed and Life-long Course:

CO2- Understanding population dynamics theories not only provides knowledge about human populations but also nurtures a set of skills and attitudes essential for self-directed and lifelong Course. It promotes curiosity, critical thinking, adaptability, and a deeper understanding of the world, enabling individuals to continually learn and grow throughout their lives.

PO8: Critical Thinking and Problem solving:

CO7- Applying population geography knowledge in development planning necessitates critical thinking to analyze data, identify challenges, and devise effective solutions tailored to the needs of diverse population

M.A./M.Sc. Geography, Syllabus for Semester II

Subject: Geography of Rural Settlement

Subject Code: GEO-4204 **No. of Credits:** 04

Course Objectives:

1. To define and understand the evolution of rural settlements and their historical context.
2. To analyze the growth and distribution of rural settlements based on various factors.
3. To explore theories of rural land use and their implications for settlement patterns.
4. To examine the economic activities prevalent in rural areas and their organization.
5. To investigate the morphogenesis of rural settlements and the factors driving transformation.
6. To assess the demographic characteristics of rural settlements and the impact of migration.
7. To study various types of rural houses and their architectural styles influenced by socio-economic factors.
8. To evaluate the patterns and characteristics of rural settlements specifically in Maharashtra.

Course Outcomes:

After completion of this course, students will be able to:

CO1: Define rural settlements and discuss their evolution from the Neolithic to modern periods.

CO2: Analyze factors affecting the growth and distribution of rural settlements.

CO3: Evaluate different theories of rural land use and their relevance to settlement patterns.

CO4: Examine the functional roles of rural economic activities and their spatial organization.

CO5: Investigate the socio-economic transformations within rural settlements.

CO6: Assess the demographic characteristics and migration trends in rural areas.

CO7: Describe various rural house types and their architectural styles.
CO8: Analyze the characteristics and patterns of rural settlements in Maharashtra.

Topics and Learning Points

1. Introduction to Geography of Rural Settlements (6 Lectures)

1.1 Definition

1.2 Evolution of settlements

1.3 Sequence of occupancy from Neolithic to modern period

1.4 Historical, cultural, and geographical aspects of settlements reflected in place names

2. Growth and Distribution (6 Lectures)

2.1 Site, situation, location

2.2 Various factors affecting settlement site and situations

2.3 Dispersion and nucleation

2.4 Factors affecting dispersion and nucleation

2.5 Methods of measuring degree of dispersion

2.6 Factors affecting growth of settlements

2.7 System of land division

2.8 Water rights system of agriculture

3. Theories of Rural Land Use (12 Lectures)

3.1 Intensity of land use

3.2 Labour cost

3.3 Marketing of products

3.4 Von Thünen Theory

3.5 Ricardo Theory

4. Rural Economic Activities (12 Lectures)

4.1 Functional analysis of service villages and trading centers

4.2 Centrality and hierarchy of rural service centers

4.3 Central Place Theory

5. Morphogenesis of Rural Settlements and Transformation (12 Lectures)

5.1 Social

5.2 Cultural

5.3 Economic organization within villages

5.4 Functional growth

5.5 Socio-economic transformation in rural areas

6. Demographic Characteristics of Rural Settlements (6 Lectures)

6.1 Age, Sex, Education, Occupation, Caste

6.2 Migration: causes and consequences of migration in rural areas

6.3 Seasonal migration

6.4 Commuting patterns

7. Rural House Types (8 Lectures)

7.1 Primitive, vernacular, and modern high-rise

7.2 Physical, social, cultural, and economic factors

7.3 Size, functional use, and architectural style

7.4 Building materials

8. Rural Settlements in Maharashtra (8 Lectures)

8.1 Various patterns

8.2 House types and settlement patterns in Maharashtra

8.3 Modern forms of rural settlements

Reference Books

1. Alam, S. M. et al. (1982): Settlement System of India, Oxford and IBH Publication Co., New Delhi.
2. Chisholm, M. (1967): Rural Settlement and Land Use, John Wiley, New York.
3. Clout, H. D. (1977): Rural Geography, Pergamon, Oxford.
4. Doniel, P. and Hopkinson, M. (1986): The Geography of Settlement, Oliver & Boyd, Edinburgh.
5. Grover, N. (1985): Rural Settlement: A Cultural Geographical Analysis, Inter India Publication, Delhi.
6. Hudson, F.S. (1976): A Geography of Settlements, Macdonald and Evans, New York.

7. Ramchandran, H. (1985): Village Clusters and Rural Development, Concept Publication, New Delhi.
8. Rao, R. N. (1986): Strategy for Integrated Rural Development, B. R. Publication, Delhi.
9. Sen, L. K. (1972): Readings in Micro Level Planning and Rural Growth Centers, National Institute of Community Development, Hyderabad.
10. Srinivas, M. N. (1968): Village India, Asia Publication House, Bombay.
11. Wanmati, S. (1983): Service Centers in Rural India, B. R. Publication Corporation, Delhi.
12. Musmade, A. H., Sonawane, A. E., and More, J. C. (2015): Population & Settlement Geography (Marathi), Diamond Publication, Pune.

Choice Based Credit System Syllabus (2019 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: M.A./MS.c Geography I **Subject:** Geography

Course: Geography of Rural Settlement **Course Code:** GEO 4204

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
CO 1				3				
CO 2				2				
CO 3			2					
CO 4							3	
CO 5								
CO 6			2		2			
CO 7				2				

Justification for the mapping

PO3: Social competence and communication skill:

CO3- By developing a comprehensive understanding of rural settlement patterns, students enhance their social competence through improved communication, empathy, cultural awareness, and engagement with diverse communities. These skills are essential for effective interaction, collaboration, and problem-solving in various social and professional contexts.

CO6- By showcasing analytical skills in identifying similarities, differences, and underlying reasons for variations, students enhance their social competence. They develop strong communication abilities, empathy, critical thinking, and problem-solving skills, preparing them for successful interactions and engagements in a globally interconnected world.

PO4: Disciplinary Knowledge:

CO1- By understanding basic concepts in rural settlement, students acquire a multidisciplinary perspective. This knowledge facilitates interdisciplinary collaboration, fosters a holistic understanding of societal dynamics, and enables comprehensive problem-solving approaches spanning various fields.

CO2- By comprehending the various types and patterns of rural settlements, students gain an interdisciplinary perspective. This knowledge integrates geographical, social, economic, environmental, and cultural aspects, fostering a holistic understanding of rural dynamics and facilitating interdisciplinary collaboration and problem-solving approaches across multiple fields.

CO7- By gaining an appreciation for the cultural diversity and historical significance of rural settlements, students develop a multidimensional understanding that integrates cultural, historical, geographical, environmental, and societal perspectives. This holistic view fosters interdisciplinary connections and enriches their knowledge base, enabling them to approach complex issues with a more comprehensive and inclusive mindset.

PO5: Personal and professional competence:

CO6- By showcasing analytical skills through the identification of similarities, differences, and underlying reasons for variations, individuals enhance their personal and professional competence. These skills are transferable and applicable across various aspects of life, empowering individuals to thrive in diverse environments and excel in their professional endeavors.

PO7:Environment and sustainability:

CO4- By critically evaluating the relationship between human activities and the natural environment in rural areas, students gain insights into the intricacies of sustainability. This knowledge empowers them to become advocates for responsible environmental stewardship, fostering a more sustainable future for rural communities and ecosystem.

M.A./M.Sc. Geography, Syllabus for Semester II

Subject: Geography of Disaster Management

Subject Code: GEO-4212 **No. of Credits:** 04

Course Objectives:

1. To define disaster management and understand its significance in mitigating hazards.
2. To differentiate between hazards and disasters and explore their geographical conditions.
3. To grasp the basic concepts and phases of disaster management.
4. To analyze the causes, effects, and mitigation strategies for various natural disasters.
5. To examine man-made disasters, their impacts, and management strategies.
6. To explore the application of modern technologies in disaster management.
7. To understand the role of various stakeholders in effective disaster management.

Course Outcomes:

After completion of this course, students will be able to:

CO1: Define disaster management and articulate its key concepts and significance.

CO2: Differentiate between hazards and disasters and analyze their geographical contexts.

CO3: Describe the phases of the disaster management cycle and the roles of stakeholders.

CO4: Evaluate the causes, effects, and mitigation strategies for various natural disasters.

CO5: Assess the impacts of man-made disasters and discuss effective management strategies.

CO6: Apply modern technologies like GIS and remote sensing in disaster management.

CO7: Understand the importance of communication and coordination during disaster events.

Topics and Learning Points

1. Introduction to Disaster Management (6 Lectures)

1.1 Concept and definition

1.2 Difference between hazard and disaster

1.3 Geographical conditions and disasters

1.4 Classification of disasters

2. Basic Concepts in Disaster Management (6 Lectures)

2.1 Concept of management

2.2 Aims and objectives

2.3 Pre-disaster management

2.4 Post-disaster management

3. Disaster Management and Measures (10 Lectures)

3.1 Phases of disaster management cycle

3.2 Importance of first aid

3.3 Standard operating procedures of management at the governmental level

3.4 Role of media in disaster management

4. Natural Disasters and Management (12 Lectures)

4.1 Earthquake

4.2 Volcano

4.3 Landslide

4.4 Tsunami

4.5 Cyclone

4.6 Flood

5. Man-Made Disasters and Management (10 Lectures)

5.1 Deforestation

5.2 Forest fire

5.3 Soil degradation

5.4 Terrorism

5.5 Major man-made disaster examples in India

6. Technologies for Disaster Management (8 Lectures)

6.1 Application of modern technologies for emergency communication

6.2 Application of remote sensing, GIS, and GPS in disaster management

Reference Books

1. Agarwal, A. and Narain, S. (Ed) (1999): State of India's Environment: The Citizens Report, Centre for Science and Environment, New Delhi.
2. Bryant, Edward (2000): Natural Hazards, Cambridge University Press.
3. Daly, H.E. (1996): Beyond Growth, Beacon Press, Boston.
4. Daly, H.E. and Twonseed, K.N. (Ed) (1993): Valuing the Earth – Economics, Ecology, and Ethics, MIT Press, London.
5. Dupont, R.R., Baxter, T.E., and Theodore, L. (1998): Environmental Management: Problems and Solutions, CRC Press.
6. Hart, M. G. (1986): Geomorphology, Pure and Applied, George Allen and Unwin, London.
7. Morrisawa, M. (Ed) (1994): Geomorphology and Natural Hazards, Elsevier, Amsterdam.
8. Singh, Savindra (2000): Environmental Geography, Parag Pustak Bhavan, Allahabad.
9. Smith, K. (2001): Environmental Hazards: Assessing Risk and Reducing Disaster, Routledge.
10. Turk, J. (1985): Introduction to Environmental Studies, Saunders College Publication, Japan.
11. Saptarshi, P.G., More, J.C., Ugale, V.R. (2009): Geography and Natural Hazards (Marathi), Diamond Publishing.
12. Musmade, A.H., More, J.C. (2014): Geography of Disaster Management (Marathi), Diamond Publication, Pune.

Mapping of Program Outcomes (POs) with Course Outcomes (COs)

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1								3
CO2		2	2					
CO3			3					
CO4			2				2	2
CO5			3				2	
CO6			3				2	
CO7			3				2	

Explanations for Specific Program Outcomes (POs)

PO2: Effective Citizenship and Ethics

CO2: This outcome emphasizes student advocacy for policies that enhance disaster resilience and social welfare. By engaging with policymakers, students learn to prioritize ethical practices in disaster management.

PO3: Social Competence

CO2: Students are prepared to work collaboratively to raise awareness about disaster preparedness in their communities.

CO4: Understanding international organizations in disaster management enhances students' global perspective.

CO5: Awareness of global disasters fosters a sense of interconnectedness and the need for cooperation.

CO6: Teamwork skills are vital in high-pressure situations, allowing students to function effectively during disasters.

CO7: Developing social awareness equips students to handle complex situations and positively impact their communities.

PO4: Disciplinary Knowledge

CO3: Students gain essential knowledge about disaster risk reduction (DRR) strategies, preparing them for emergencies.

PO7: Environment and Sustainability

CO5: Students explore how disaster risk reduction strategies relate to the UN Sustainable Development Goals (SDGs), emphasizing the need for environmental sustainability.

CO6: Training in rescue operations includes consideration of environmental impacts, promoting sustainability in disaster responses.

CO7: Awareness campaigns on environmental issues encourage students to foster eco-conscious behaviors.

PO8: Critical Thinking and Problem Solving

CO1: Critical thinking is applied in scenario planning, enabling students to devise strategic disaster preparedness plans.

CO4: Engaging in critical analysis of disaster management issues encourages innovative solutions and prepares students for complex challenges.

M.A./M.Sc. Geography, Syllabus for Semester II

Subject: Practical in Surveying

Subject Code: GEO-4213 **No. of Credits:** 04

Course Objectives:

1. To define surveying and its significance in geographical studies.
2. To understand the various methods and techniques used in surveying.
3. To explore the concepts of benchmarks, spot heights, and reduced levels.
4. To gain proficiency in dumpy level surveying techniques, including profile drawing and block contouring.
5. To comprehend the components and functions of theodolites in surveying.
6. To analyze the intersection and tachometric methods used in theodolite surveys.
7. To learn about the operation and applications of total stations for accurate measurements.

Course Outcomes:

After completion of this course, students will be able to:

CO1: Define surveying and articulate its importance in spatial analysis.

CO2: Identify and utilize benchmarks, spot heights, and reduced levels effectively in practical applications.

CO3: Demonstrate proficiency in dumpy level surveying techniques, including the collimation method and rise and fall method.

CO4: Explain the components and terminology associated with theodolite surveys.

CO5: Apply intersection and tachometric methods to obtain precise measurements.

CO6: Operate total stations for area and profile drawing in various surveying contexts.

CO7: Integrate theoretical knowledge with practical skills in surveying techniques.

Topics and Learning Points

1. Introduction to Surveying (6 Lectures)

1.1 Definitions and methods

1.2 Benchmarks

1.3 Spot heights

1.4 Reduced levels

1.5 Interpolation and contouring

2. Dumpy Level Survey (8 Lectures)

2.1 Various components and common terms used in dumpy level survey

2.2 Collimation method and rise and fall method

2.3 Profile drawing and block contouring

3. Theodolite Survey (8 Lectures)

3.1 Various components and common terms used in theodolite

3.2 Intersection method and tachometric method

4. Total Station (6 Lectures)

4.1 Various components and common terms used in total station

4.2 Area and profile drawing

Reference Books

1. Sarkar, A. (2015): Practical Geography, A Systematic Approach, Orient Black Swan.
2. Duggal, S.K. (2013): Surveying Vol. 2, McGraw Hill Publication, New York.
3. Kanetkar, T.P. and Kulkarni, S.V. (2010): Surveying and Leveling Vol. II, Pune Vidyarthi Publication, Pune.
4. Maslov, A.V., Gordeev, A.V., and Batrakov, Yu.G. (1984): Geodetic Surveying, Mir Publishers, Moscow.
5. Rangwala, S.C. (2011): Surveying and Leveling, Charotar Publishing House Pvt. Ltd., Anand, Gujarat, India.
6. Punmia, B.C., Jain, A., and Jain, A. (2011): Surveying, Vol. II and III, Laxmi Publication, New Del

Choice Based Credit System Syllabus (2019 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: M.A./MS.c Geography I **Subject:** Geography

Course: Practical in surveying **Course Code:** GEO4213

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
CO 1				2				
CO 2			2					
CO 3				2				
CO 4	2							
CO 5				2				
CO 6								3
CO 7								2

Justification for the mapping

PO1:Research-Related Skills and Scientific temper:

CO4- By honing accuracy and precision in survey measurements, students cultivate a set of research-related skills that are essential for conducting high-quality research across diverse disciplines. These skills form the basis for conducting rigorous and impactful research studies.

PO3: Social competence and communication skill:

CO2- By engaging in the creation of plans and maps for measured areas, students develop communication skills necessary for conveying technical information effectively, collaborating across disciplines, engaging stakeholders, and presenting findings in a clear, accessible manner—essential skills for successful communication in both academic and professional settings.

PO4: Disciplinary Knowledge:

CO1- By understanding the basic concepts in practical surveying, students build a solid foundation for deeper disciplinary knowledge in surveying techniques, methodologies, and applications. This foundational understanding sets the stage for further exploration,

specialization, and advancement within the field of surveying.

CO3- By acquiring the skills necessary for independent field surveys and accurate data collection, students enhance their disciplinary knowledge in surveying by bridging theoretical concepts with practical applications, enabling them to excel in their field with hands-on expertise.

CO5- By creating topographic maps using survey data, contour lines, and elevation measurements, students deepen their disciplinary knowledge in surveying by honing spatial interpretation, data visualization, problem-solving, and communication skills essential for comprehensive surveying practices.

PO8: Critical Thinking and Problem solving:

CO6- Demonstrating problem-solving skills during field surveys nurtures critical thinking abilities by promoting analytical thinking, creative problem-solving, effective decision-making, adaptability, and continuous improvement. These skills are crucial not only in surveying but in various professional settings requiring adaptive and innovative problem-solving approaches.

CO7- By engaging in the process of creating topographic maps using survey data, contour lines, and elevation measurements, students apply critical thinking and problem-solving skills, fostering a deeper understanding of surveying principles, spatial representation, and the complexities of landscape interpretation

M.A./M.Sc. Geography, Syllabus for Semester II

Subject: Practical in statistical Techniques for geography

Subject Code: GEO-4214 **No. of Credits:** 04

Course Objectives:

1. To introduce statistical techniques and their applications in geographical research.
2. To differentiate between descriptive and inferential statistics and their relevance in geography.
3. To explore various types of geographical data, including primary, secondary, spatial, and temporal data.
4. To understand scales of measurement, including nominal, ordinal, interval, and ratio scales.
5. To gain proficiency in descriptive statistics, focusing on measures of central tendency and dispersion.
6. To analyze probability distributions and their significance in geographical studies.
7. To apply inferential statistics and conduct hypothesis testing, including Chi-square tests and ANOVA.

Course Outcomes:

After completion of this course, students will be able to:

CO1: Explain the significance of statistical techniques in geographical research.

CO2: Differentiate between types of statistics and the various types of geographical data.

CO3: Calculate and interpret measures of central tendency and dispersion for both ungrouped and grouped data.

CO4: Understand and apply different probability distributions relevant to geographical data.

CO5: Conduct hypothesis testing using Chi-square tests and Student's t-tests.

CO6: Analyze correlation and regression relationships in geographical data sets.

CO7: Collect, analyze, and report on geographical data through fieldwork using appropriate statistical techniques.

Topics and Learning Points

1 - Introduction to Statistical Techniques in Geography (10 Lectures)

1.1 Introduction and applications of statistical techniques in Geography

1.2 Types of statistics: descriptive and inferential statistics

1.3 Scales of measurement: nominal, ordinal, interval, and ratio

2 - Descriptive Statistics (12 Lectures)

2.1 Introduction to descriptive statistics

2.2 Central tendency: mean, mode, median

2.3 Dispersion: variance and standard deviation Skewness and kurtosis

2.4 Calculations of above parameters for ungrouped and grouped data

3 - Probability and Probability Distributions (12 Lectures)

3.1 Introduction to probability

3.2 The Normal Probability Distribution

3.3 The Binomial Probability Distribution

3.4 The Poisson Probability Distribution

4 - Inferential Statistics (12 Lectures)

4.1 Introduction to inferential statistics

4.2 Population and sample

4.3 Hypothesis testing: Null and alternate hypothesis

4.4 The Chi-square test (Two sample case)

4.5 Student's 't' test (Two sample tests)

4.6 ANOVA (Analysis of variance)/ F ratio test

5 - Correlation and Regression Analysis (10 Lectures)

5.1 Introduction to bi-variate correlation and regression

5.2 The product-moment correlation coefficient

5.3 Significance testing in correlation analysis

5.4 Linear regression equation

5.5 Exponential regression equation

5.6 Power-law regression equation

5.7 Concept of residuals and explained variance

6 - Time Series Analysis (10 Lectures)

6.1 Introduction and definition of time series

6.2 Applications of time series analysis

6.3 Components of time series

6.4 Calculation and plotting of moving averages (3 and 5)

6.5 Curve fitting by method of least squares

7 - Fieldwork and Data Collection (8 Lectures)

7.1 Collection of primary and/or secondary data by fieldwork or field visit

7.2 Analysis of data by using appropriate statistical technique

7.3 Report writing

Reference Books

1. Asis Sarkar (2015): Practical Geography, A Systematic Approach, Orient Black Swan.
2. David, E. (1989): Statistics for Geographers.
3. Elhance, D.L., Elhance, V., and Aggarwal, B.M. (2014): Fundamentals of Statistics, Kitab Mahal, Allahabad.
4. Hammond, R. and McCullagh, P. (1978): Quantitative Techniques in Geography, Clarendon Press, Oxford, London.
5. Karlekar, S. and Kale, M. (2006): Statistical Analysis of Geographical Data, Diamond Publication, Pune.
6. Liendsor, J. M. (1997): Techniques in Human Geography, Routledge.
7. Norcliffe, G.B. (1977): Inferential Statistics for Geographers, Hutchinson, London.
8. Rogerson, P.A. (2015): Statistical Methods for Geography, SAGE Publication, London.
9. Wheller, D., Shaw, G., and Barr, S. (2010): Statistical Techniques in Geographical Analysis, David Fulton, Routledge, New York

Choice Based Credit System Syllabus (2019 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: M.A./MS.c Geography I **Subject:** Geography

Course: Practical in statistical Techniques for geography

Course Code: GEO4214

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
CO 1				2				
CO 2	2							
CO 3			2					
CO 4								3
CO 5			2					
CO 6				2				
CO 7								2

Justification for the mapping

PO1: Research-Related Skills and Scientific temper:

CO2- By applying various statistical techniques in geographical research, students not only enhance their statistical and analytical skills but also develop a broader skill set encompassing research design, hypothesis testing, critical evaluation, and interdisciplinary integration. These skills are invaluable for conducting high-quality and impactful research in the field of geography.

PO3: Social competence and communication skill:

CO3- By gaining practical experience through field visits and data collection, students not only develop technical competencies but also nurture social competence and communication skills crucial for effective interaction, collaboration, and engagement in diverse settings.

CO5- Group work serves as a platform for students to practice and refine their social competence and communication skills, preparing them for effective collaboration,

communication, and interaction in various personal, academic, and professional settings.

PO4: Disciplinary Knowledge:

CO1- By comprehending and embracing various techniques used in geography, students deepen their disciplinary knowledge, becoming adept at selecting, applying, and critically evaluating methodologies best suited to address geographical inquiries and challenges.

CO6-By fostering teamwork skills, individuals in geography can leverage collective expertise, diverse perspectives, and collaborative efforts to advance the discipline's knowledge base, solve complex geographical problems, and make substantial contributions to the field**.**

PO8: Critical Thinking and Problem solving:

CO4- By actively participating in problem-solving, fieldwork, and data collection, analysis, and interpretation, individuals in geographical research cultivate critical thinking skills essential for evaluating, synthesizing information, making informed decisions, and addressing complex issues within the discipline.

CO7- By comprehensively understanding and identifying various statistical tools, students cultivate critical thinking skills essential for methodological rigor, problem-solving in data analysis, and the ability to make informed decisions based on statistical evidence within the field of geography.