



Tuljaram Chaturchand College, Baramati

Autonomous College

Two Year Degree Program in Geography

(Faculty of Science & Technology)

Revised Syllabus for

M.A./M.Sc. (Geography) Part-I

For Tuljaram Chaturchand College, Baramati

Sem-II (2022 Pattern)

Choice Based Credit System Syllabus

To be implemented from Academic Year 2022-2023

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 syllabus.

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.

Programme outcomes (Pos) (M.A./M.Sc. Geography):

PO.1. Ability of Problem Analysis: Student will be able to analyse the problems of physical as well as cultural environments of both rural and urban areas. Moreover, they will try to find out the possible measures to solve those problems.

PO.2. Conduct Social Survey Project: They will be eligible for conducting social survey project, which is necessary for the assessment of development status of a particular group or section of the society.

PO.3. Individual and teamwork: Works effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.

PO.4. Application of modern instruments: Students will be able to apply various modern instruments for data collection and field survey.

PO.5. Application of GIS and modern Geographical Map Making Techniques: Students will learn how to prepare map based on GIS by using the modern geographical map-making techniques.

PO.6. Critical Thinking: Students will be able to understand and solve the critical problems of physical and cultural environment.

PO.7. Development of Observation Power: As a student of Geography, they will be capable to develop their observation power through field experience and in future, they will be able to identify the socio-environmental problems of a locality.

PO.8. Development of Communication Skill and Interaction Power: After the completion of the course, they will be efficient in their communication skill as well as power of social interaction.

PO.9. Effective Citizenship: Demonstrate empathetic social concern and equity centred national development and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO.10. Enhancement of the ability of Management: Demonstrate knowledge and understanding of the management principles and apply these to their own work, as a member and leader in a team, to manage projects. They will perform effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO.11. Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions and accept responsibility for them.

PO.12. Understand Environmental Ethics and Sustainability: Understand the impact of the acquired knowledge in societal and environmental contexts and demonstrate the knowledge of need for sustainable development.

PO.13. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context social, environmental and technological changes.

PO.14. Presentation Skill: Students are being able to understand and write effective reports and design credentials, make effective demonstrations, give and receive clear instruction.

Tuljaram Chaturchand College, Baramati

Autonomous College

Board of Studies in Geography

From 2022-23 To 2024-25

Sr.No.	Name	Designation
1.	Dr. Asaram S. Jadhav	Chairman
2.	Dr. Arun S. Magar	Member
3.	Mr. Vinayak D. Chavan	Member
4.	Ms. Nayan D. Zagade	Member
5.	Ms. Aarti M. Borade	Member
6.	Dr. Santosh Lagad	Vice-Chancellor Nominee
7.	Dr. Pravin Kokane	Expert from other University
8.	Dr. T. P. Shinde	Expert from other University
9.	Dr. Babaji Maskare	Industry Expert
10.	Mr. Ganesh Ghanawat	Meritorious Alumni
11.	Ms. Akshata Raje	Student
12.	Mr. Vaibhav Harihar	Student

M.A./M. Sc. [I] **M.Sc. GEOGRAPHY PROGRAMME CREDIT DISTRIBUTION PATTERN (108)**

Class	Semester	Core Course	Elective Course			Ability Enhancement Compulsory Courses (AECC)		Total Credit
			Discipline Specific Elective	Dissertation Project	Generic Elective Course	Ability Enhancement Compulsory Courses	Skill Enhancement Courses	
M.Sc. I	I	i) PAGG111 Principles of Geomorphology ii) PAGG112 Principles of Climatology iii) PAGG113 Principles of Economic Geography iv) PAGG114 Principles of Population and Settlement Geography	-	-	HR – I 2 Credit CS – I 2 Credit	Communication Skill 2 Credit	i) PAGG115 Practical in Physical Geography ii) Practical in Human Geography	30
	II	4 papers 4 x 4= 16 Credits	-	-	CS – II 2 Credit	-	2 Practicals = 8 Credits	26
M.Sc. II	III	3 papers 3 x 4= 12 Credits	Paper (A) 4 Credit <i>OR</i> Paper (B) 4 Credits	-	-	-	2 Practicals = 8 Credits Subject Related Skill Dev. Course 2 Credit	26
	IV	3 papers 3 x 4= 12 Credits	Paper (A) 4 Credit <i>OR</i> Paper (B) 4 Credits	1 Project = 4 Credits	-	-	1 Practical = 4 Credits Subject Related Skill Dev. Course 2 Credit	26
Total Credits		56	8	4	6	2	32	108

Structure of the Syllabus:**Semester – I**

Sr. No.	Course Code	Core Compulsory Theory Paper (CTTP)	Choice Based Optional Paper (CBOP)	Core Compulsory Practical Paper (CCPP)	Credit
1	PAGG111	Principles of Geomorphology	-	-	04
2	PAGG112	Principles of Climatology	-	-	04
3	PAGG113	Principles of Economic Geography	-	-	04
4	PAGG114	Principles of Population and Settlement Geography	-	-	04
5	PAGG115	-	-	Practical in Physical Geography	04
6	PAGG116	-	-	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	PAGG121	Geoinformatics - I					04
One of the following according to specialization from CCTP							
2	PAGG122 (A)	Synoptic Climatology	-	-	04	-	04
	PAGG122 (B)	Population Geography	-	-	04	-	
One of the following according to specialization from CCTP							
3	PAGG123 (A)	Monsoon Climatology	-	-	04	-	04
	PAGG123 (B)	Geography of Rural Settlements	-	-	04	-	
Optional Paper (CBOP) (1 Theory + 1 Practical)							
4	PAGG124			Geography of Disaster Management	04		08
	PAGG125			Practical in Surveying	04		
Core Compulsory Practical Paper (CCPP)							
5	PAGG126					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
PAGG231	Geoinformatics-II	-	-	04	-	04
PAGG232	Geographical Thoughts	-	-	04	-	04
One of the following according to specialization from CCTP						
PAGG233 (A)	Agro Meteorology	-	-	04	-	04
PAGG233 (B)	Urban Geography	-	-	04	-	
Choice Based Optional Paper (CBOP) (1Theory + 1Practical)						
PAGG234			Practical in GIS	04	-	08
PAGG234			Watershed Management	04	-	
One of the following according to specialization from CCPP						
PAGG235 (A)					Practical in Climatology	04
PAGG235 (B)					Practical in Population and Settlement Geography	
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
PAGG241	Geography of India	-	-	-	-	04
PAGG242	Oceanography	-	-	-	-	04
PAGG243	Research Methodology	-	-	-	-	04
Choice Based Optional Paper (CBOP) (1Theory + 1Practical)						
PAGG244			Geography of Soils	04		04
PAGG245			Practical in Remote Sensing	04		
Core Compulsory Practical Paper (CCPP)						
PAGG246					Dissertation / Research Project	04
Total Credits of Semester - IV						24

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

Subject: Geoinformatics I

Subject Code: PAGG 121

No. of Credits: 04

Course Objectives:

1. To introduce the fundamentals of Geographical information system.
2. To prepare for the practical work with GIS System.
3. They can know about concepts, components, development, platforms.
4. They understand about aerial photography and satellite remote sensing.
5. Know about GIS data structures.
6. Develop an idea about interpretation and application of remote sensing and GIS.
7. They know about the types of remote sensing and GIS.

Course Outcomes:

After the completion of the course, Students will be able to-

1. Students will understand basic concepts in Geoinformatics.
2. Students will able to carry out practical work in GIS Software's.
3. Students will able create a thematic maps and location maps of study area.
4. Understand the ethical and legal considerations associated with geoinformatics.
5. Explore and apply geoinformatics tools and techniques in different domains.
6. Gain proficiency in using Geographic Information System (GIS) software for data analysis, mapping, and visualization.
7. Develop critical thinking skills to analyze geospatial problems and propose effective solutions.

Unit No	Topic Name	Lectures
1	Introduction to GIS 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.	06
2	Database 2.1 Spatial: spatial relationship, functional 2.2 relationship, logical relationship 2.3 Non-spatial: nominal, ordinal, ratio and cyclic	06
3	Data Models 3.1 Spatial: Geometric primitives, Raster, Vector, 3.2 Quad tree tessellation, comparative overview of 3.3 raster and vector models, layers and coverage 3.4 Non-spatial: DBMS- Advantages, conceptual models; Implementational 3.5 models-hierarchical, network and relational	12
4	Structuring of Spatial Data 4.1 Digitizers: manual, semi-automatic & automatic 4.2 Editing error: detection & correction, topology building	12
5	Data Analysis (I) 5.1 Attribute databases: operations from algebraic theory 5.2 Operations from set theory SQL: attribute query	12
6	Data Analysis (II) 6.1 Spatial Databases: map algebra, grid Operations: Local, Focal 6.2 SQL: spatial query	12

Reference Books:

- **Burroughs, P. A. and McDonnell, R. A. (2002):** Principles of Geographical Information System, Oxford University Press.
- **George J. (2004):** Fundamentals of Remote Sensing, Universities Press Pvt. Ltd., Hyderabad.
- **Jensen, J. R. (2003):** Remote Sensing of Environment, An Earth Resource Perspective, Pearson Education Pvt. Ltd., New Delhi.
- Kang- Tsung-Chang, Introduction to Geographical Information System, 2002, McGraw Hill.
- **Lillesand, T. M. and Kiefer R. W. (2002):** Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
- **Lo C. P. and Yeung, A. K. W. (2002):** Concepts and Techniques of Geographic Information System, Prentice Hall, India.
- **Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D W. Rhind, (2002):** Introduction to Geographic Information Systems and Science, John Wiley and Sons Ltd.
- Fundamentals of Remote Sensing, A Canada Centre for Remote Sensing Remote Sensing Tutorial.
https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/resource/tutor/fundam/pdf/fundamentals_e.pdf

Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes**Class:** M.A. /M.Sc. Geography I**Subject:** Geography**Course:** Geoinformatics-I**Course Code:** PAGG 121**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.

Subject: Synoptic Climatology

Subject Code: PAGG 122 (A)

No. of Credits: 04

Course Objectives:

1. To introduce the fundamentals of Synoptic Climatology.
2. To learn the various weather phenomenon and their effect.
3. To gain a comprehensive understanding of the synoptic-scale atmospheric processes that influence climate patterns.
4. To understand and apply climate classification systems.
5. Explore the relationships between synoptic weather system.
6. To develop skills in applying synoptic climatology methods to research questions.
7. To observe and analyses climate data effectively through reports.

Course Outcomes:

After the completion of the course, -

1. Students will understand basic concepts in Synoptic Climatology.
2. Students will understand the weather phenomenon and their effects.
3. Students should comprehend synoptic-scale weather patterns, including their characteristics, formation with their phenomena.
4. Interpreting synoptic weather maps, satellite imagery, and meteorological data to analyze and predict weather patterns.
5. Ability to identify and analyze climate anomalies and extreme weather events linked to synoptic-scale weather systems.
6. Developing critical thinking skills to analyze and solve complex problems related to synoptic weather systems and their influence on climate variability and change.
7. Ability to communicate complex synoptic climatology concepts, observations, and analyses effectively through reports, presentations.

Unit No	Topic Name	Lectures
1	Introduction to Synoptic Climatology 1.1 Definition, Nature and Scope 1.2 Levels of Climatological Synthesis 1.3 Approaches (Analytical approach ,Synoptic approach)	06
2	Weather reporting and analysis 2.1 Observing, reporting, collecting and analysis of weather data by IMD 2.2 Synoptic charts and maps 2.3 Synoptic scale motion, laws of motion	06
3	Tropical Weather Systems 3.1 Easterly waves formation and characteristics. 3.2 Tropical cyclones (formation, life cycle, structure , dynamic) 3.3 Thunderstorm (origin, structure and stages of development) 3.4 Tornadoes-development and occurrences	12
4	Extra-Tropical Weather Systems 4.1 Air masses and fronts 4.2 Air masses of North America, Europe and Asia 4.3 Types of fronts 4.4 Frontal weather, fronto genesis and frontolysis 4.5 Principal zones of fronto genesis 4.6 Rossby waves, wave cyclone-formation, lifecycle, Idealized weather	12
5	Weather Patterns 5.1 Clouds-classification 5.2 Precipitation processes 5.3 Fog- formation and types 5.4 Heat and cold waves	12
6	Weather Forecasting 6.1 Types of weather forecasting 6.2 Methods of weather forecasting 6.3 Role of satellites	06
7	Application of Synoptic Climatology 7.1 Application in pollution studies 7.2 Marine activities 7.3 Aviation 7.4 Disaster prevention and preparedness 7.5 Agriculture	06

Reference Books:

- Barry, R.G. and Perry, A.H. (1973): Synoptic Climatology: Methods and Applications, Methuen and Co. Ltd., London.
- Lutgens, Frederic K. and Tarbuck, Edward J. (2010): The Atmosphere: An Introduction to Meteorology, Pearson Prentice Hall, New Jersey.
- Navarra, J.G. (1979): Atmosphere, Weather and Climate, W.B. Saunders Company, Philadelphia.
- Petterson, S. (1969): Introduction to Meteorology, McGraw Hill, New York.
- Rama Sastry, A.A. (1984): Weather and Weather Forecasting, Publications Division, Ministry of Information and Broadcasting, Government of India, New Delhi.
- Stringer, E.T. (1972): Foundations of Climatology, W.H. Freeman and Company, New York.

Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes**Class:** M.A. /M.Sc Geography I**Subject:** Geography**Course:** Synoptic Climatology**Course Code:** PAGG 122(A)**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.

CO7- The ability to communicate complex synoptic climatology 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 Synoptic Climatology 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 weather 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 climate 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.

Subject: Population Geography**Subject Code: PAGG 122(B)****No. of Credits: 04**

Course Objectives:

1. To introduce the fundamentals of Population Geography.
2. To learn the various theories of population geography.
3. To make students aware of the need and importance of population and policies.
4. To aware knowledge about distribution of population in different region.
5. This course gives an idea to collect the population data.
6. To notify the students about different structures and characteristics of population.
7. To give information about growth and population density of different region of the world.

Course Outcomes:

After the completion of the course, Students will be able to-

1. Students will understand basic concepts in population geography.
2. Students will understand various theories regarding population dynamics.
3. Understood the dynamic of population and its role in population policies.
4. Realize worldwide distribution of population.
5. Understand about population structure and characteristics.
6. Understand the population growth of different countries.
7. Apply knowledge of population geography in development planning.

Topics and Course points

Unit No	Unit Name	Lectures
1	Introduction Population Geography 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)	06
2	Population Dynamics 2.1 Population distribution in the world 2.2 Density of population in the world 2.3 Determinates of population growth	06
3	Population Theory 3.1 Malthus Theory 3.2 Optimum Population Theory 3.3 Demographic Transition Model	08
4	Fertility 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	08
5	Mortality 5.1 Concept of mortality & morbidity 5.2 Measures of mortality 5.3 Recent mortality levels in world 5.4 Mortality trends in India	06
6	Migration 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	10
7	Population Composition 7.1 Demographic 7.2 Social 7.3 Economic 7.4 Cultural	06
8	Population Development and Policies 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	10

Reference Books:

- **Agarwala, S.N. (1977):** India's population Problems, Tata McGraw Hill publishing Co. Ltd., New Delhi.
- **Bose Ashis et.al. (1974):** Population in India's Development Vikas Publishing House, New Delhi, 1974.
- **Chandna R.C. (1986):** Geography of Population concepts, Determinants and Patterns, Kalayani Publishers, New Delhi
- **Clarke J.I.:** Population Geography, Pergamon Press, Oxford, 1973.
- **Clarke J.I. (Ed) (1984):** Geography and Population, Approaches and Applications, Pergamon Press, Oxford
- **Crook Nigel:** Principles of Population and Development, Pergamon Press New York, 1997.
- **Garnier B.J. (1970):** Geography of Population, Longman, London
- **Pathak, K.B. and F. Ram, (1992):** Techniques of demographic analysis. Bombay: Himalaya Publishing house
- **Sundaram K. V. and Sudesh Nangia (Ed) (1986):** Population Geography, Heritage Publications, Delhi
- **UNDP (2002):** Human Development Report, Oxford, 2002.
- **Woods R. (1970):** Population Analysis in Geography, Longman, London
- **Zelinsky Wilbur (1966) :** A Prologue to Population Geography Prentice Hall
- **Musmade Arjun, Sonawane Amit and Jyotiram More, (2015):** Population & Settlement Geography (Marathi)-Diamond Publication Pune.

Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes**Class:** M.A./M.Sc. Geography I**Subject:** Geography**Course:** Population Geography**Course Code:** PAGG 122(B)**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 populations. It involves problem-solving skills to address complex socio-economic issues and create sustainable, inclusive development strategies.

Subject: Monsoon Climatology**Subject Code:** PAGG 123(A)**No. of Credits: 04**

Course Objectives:

1. To introduce the fundamentals of Monsoon Climatology.
2. To learn the mechanism of Monsoon wind and effects of monsoon .
3. To comprehend the mechanisms and dynamics that drive monsoon systems.
4. To explore the regional variations in monsoon behavior across different continents.
5. Understanding the specific characteristics and impacts in various regions.
6. To understand techniques and methodologies used in predicting and forecasting monsoon behavior.
7. To examine the relationship between climate change and monsoon variability.

Course Outcomes:

After the completion of the course, Students will be able to-

1. Students will understand basic concepts in Monsoon Climatology
2. Students will understand relationship between Monsoon wind and associated weather phenomenon.
3. Students will able to forecast and predict the weather patterns.
4. Students will develop a comprehensive understanding of the mechanisms, patterns, and variability of monsoon systems across different regions globally.
5. Students will be able to identify and compare regional variations in monsoon behavior.
6. Students will evaluate the impacts of monsoons on local climates, ecosystems, agriculture, water resources, economies, and societies in monsoon-affected regions.
7. Students will explore the relationship between climate change and monsoon variability.

Topics and Course points

Unit No	Unit Name	Lectures
1	Introduction Monsoon Climatology 1.1 Introduction and scope of Monsoon Climatology 1.2 Historical background and economic 1.3 Importance of monsoon	08
2	Origin of Monsoon 2.1 Different concepts related to origin of Monsoon (Thermal concept, Flohns concept, Aerological concept) 2.2 The Asian Monsoon : East and South Asian Monsoon 2.3 Classical Theory of Indian Monsoon 2.4 Tibetan Plateau and Monsoon	10
3	Monsoon Model 3.1 Driving mechanism 3.2 Monsoon on non-rotating and rotating Earth 3.3 Realistic Monsoon Model 3.4 Normal temperature, wind and pressure, 3.5 Dates of onset and withdrawal of monsoon rainfall	10
4	Regional Aspects of Indian Monsoon 4.1 Semi-permanent systems- heat low, Monsoon trough, 4.2 Easterly Jet, Tibetan High	06
5	Intra-seasonal Variation 5.1 Active and break period, depressions, trough of low Pressure 5.2 Mid-tropospheric disturbances ,off shore and onshore vortices Effect of topography	06
6	Interannual Variation 6.1 Variability of summer monsoon rainfall 6.2 Meteorological Teleconnections : (ENSO) 6.3 Indian Ocean Dipole (IOD) 6.4 North Atlantic Oscillation (NAO) 6.5 Walker Circulation 6.6 Role of ocean and upper atmosphere	12
7	Forecasting of Monsoon 7.1 Different time scales 7.2 Factors of forecasting 7.3 Power regression and parametric model 7.4 Current monsoon forecasting system of India Meteorological Department MONEX and IIOE	08

Reference Books:

- **Das, P. K.(1991):** Monsoons,National Book Trust,NewDelhi.
- **Fein, J. S. and Stephens, P.L. (1987):**Monsoons, John Wiley and Sons, New York.
- **Keshavmurty, K.N.(1992):**The Physics of Monsoons, Allied PublishersLimited, New Delhi.
- **Pant, G. B. and Rupa Kumar,K.(1997):**Climates of South Asia, John Wileyand sons,Chichester.
- **Rao,Y.P.(1976):**Meteorological Monograph, Meteorology No.1/1976, Southwest Monsoon, India Meteorological Department.

Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes**Class:** M.A./M.Sc Geography I**Subject:** Geography**Course:** Monsoon Climatology**Course Code:** PAGG 123(A)**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				3				
CO 4			2					
CO 5				2				
CO 6								3
CO 7			2					

Justification for the mapping**PO3: Social competence and communication skill:**

CO4- Comprehending the mechanisms and variability of monsoon systems globally not only deepens meteorological knowledge but also cultivates social competence and communication skills. It promotes cultural sensitivity, global awareness, effective communication across diverse audiences, and the ability to engage and collaborate within communities, all of which are essential aspects of social competence and strong communication abilities.

CO7- Exploring the relationship between climate change and monsoon variability nurtures social competence by fostering empathy, global awareness, effective communication, interdisciplinary collaboration, and a sense of responsibility towards addressing environmental challenges—a crucial skill set for contributing to a sustainable and interconnected world.

PO4: Disciplinary Knowledge:

CO1-By understanding basic concepts in Monsoon Climatology, students gain a foundational understanding of weather and climate systems, enabling them to apply this knowledge across various disciplines, fostering interdisciplinary approaches to studying and addressing challenges related to climate, environment, agriculture, and more.

CO3- Mastering the skill of weather prediction enhances disciplinary knowledge by providing practical applications in various fields. It promotes data analysis, critical thinking, and decision-making abilities, essential for addressing challenges across disciplines and industries.

CO5- By comprehending and comparing regional variations in monsoon behavior, students gain a deeper understanding of climatic diversity, socio-economic impacts, environmental dynamics, and cultural adaptations. This knowledge fosters interdisciplinary approaches and informed decision-making across various fields.

PO7: Environment and sustainability:

CO2- By comprehending the relationship between monsoon winds and associated weather phenomena, students gain insights into the intricate connections between weather patterns and environmental sustainability. This knowledge forms the basis for informed decision-making, sustainable resource management, and proactive measures to address climate-related challenges, contributing to a more sustainable and resilient environment.

PO8: Critical Thinking and Problem solving:

CO6- By evaluating the diverse impacts of monsoons on local climates, ecosystems, agriculture, water resources, economies, and societies, students develop critical thinking skills. They learn to identify problems, analyze data, consider multiple perspectives, and propose innovative solutions, preparing them to address complex challenges in diverse fields.

Subject: Geography of Rural Settlements

Subject Code: PAGG 123(B)

No. of Credits: 04

Course Objectives:

1. To introduce the fundamentals of Geography of Rural Settlements
2. To learn hierarchy evolution types and patterns of rural settlement.
3. To examine the relationship between rural settlements and the natural environment.
4. To appreciate the cultural heritage and historical significance of rural settlements.
5. To understand the role of technology and infrastructure in rural settlement development.
6. To develop skills in spatial analysis, including interpreting maps, analyzing settlement patterns.
7. To compare and contrast rural settlement patterns across different regions or countries.

Course Outcomes:

After the completion of the course, Students will be able to-

1. Students will understand basic concepts in rural settlement.
2. Students will know different types and pattern of rural settlement.
3. Students will develop a comprehensive understanding of rural settlement patterns in different region.
4. Students will critically evaluate the relationship between human activities and the natural environment in rural areas.
5. Students will compare and contrast rural settlement patterns across different regions or countries.
6. Student will be able to identifying similarities, differences, and the underlying reasons for variations, showcasing their analytical skills.
7. Students will gain an appreciation for the cultural diversity and historical significance of rural settlements.

Unit No	Unit Name	Lectures
1	Introduction to Geography of Rural Settlements 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	05
2	Growth and Distribution 2.1 Site, situation, location 2.2 Various factors affecting on settlement site and situations 2.3 Dispersion and nucleation 2.4 Factors affecting dispersion and nucleation 2.5 Methods of the measuring degree of dispersion 2.6 Factors affecting growth of settlements 2.7 System of land division 2.8 Water rights system of agriculture	10
3	Theories of Rural Land Use 3.1 Intensity of land use 3.2 Labour cost 3.3 Marketing of product 3.4 Von Thunen Theory 3.5 Ricardo Theory	10
4	Rural Economic Activities 4.1 Functional analysis of service village and trading Center 4.2 Centrality and hierarchy of rural service centers 4.3 Central Place Theory	05
5	Morphogenesis of Rural Settlements and Transformation 5.1 Social 5.2 Cultural 5.3 Economic organization with in villages 5.4 Functional growth 5.5 Socio-economic transformation in rural areas	10
6	Demographic Characteristics of Rural Settlement 6.1 Age, Sex, Education, Occupation, Caste 6.2 Migration: causes & consequence of migration in rural areas 6.3 Seasonal migration 6.4 Commuting patterns	10
7	Rural House Types 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 material	05
8	Rural Settlements in Maharashtra 8.1 Various patterns 8.2 House types and settlement patterns in the Maharashtra 8.3 Modern forms of rural settlements	05

Reference Books:

- **Alam, S.M. et. al. (1982):** Settlement System of India Oxford and IBH Publication Co., New Delhi.
- **Chisholm M. (1967):** Rural Settlement and Land use. John Wiley, New York.
- **Clout, H.D. (1977):** Rural Geography, Pergamon, Oxford.
- **Doniel, P. and Hopkinson, M. (1986):** The Geography of settlement Oliver & Boyd, Edinburgh.
- **Grover, N. (1985):** Rural Settlement: A Cultural Geographical Analysis. Inter India Publication, Delhi.
- **Hudson, F.S. (1976):** A Geography of Settlements, Macdonald and Evans, New York.
- **Ramchandran, H. (1985):** Village clusters and Rural Development. Concept Publication, New Delhi.
- **Rao R. N. (1986):** Strategy for Integrated Rural Development. B.R. Publication, Delhi.
- **Sen, L.K. (1972):** Readings in Micro-level Planning and Rural Growth Centers, National Institute of Community Development, Hyderabad.
- **Srinivas M.N. (1968):** Village India, Asia Publication House, Bombay.
- **Wanmati S. (1983):** Service Centers in Rural India, B.R. Publication Corporation, Delhi.
- **Musmade AH, Sonawane AE, More JC, (2015):** Population & Settlement Geography, (Marathi), Diamond Publication, Pune

Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes**Class:** M.A. /M.Sc. Geography I**Subject:** Geography**Course:** Geography of Rural Settlement**Course Code:** PAGG 123(B)**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	2							
CO 6			2		2			
CO 7				2				

Justification for the mapping**PO1 Research-Related Skills and Scientific Temper**

CO5- The role of technology and infrastructure in rural settlement development will increase the research capability of students in terms of urban planning and development.

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 ecosystems.

Subject: Geography of Disaster Management**Subject Code: PAGG 124****No. of Credits: 04**

Course Objectives:

1. To introduce the fundamentals of Disaster Management.
2. To learn the role of geographical factors in Disaster Management.
3. To introduce various mitigation strategies for disaster management.
4. To make students well aware of the basic concepts and nature of preparedness.
5. To understand disaster risk reduction strategies.
6. To understand procedure on government level.
7. To make students well aware of international disaster response and cooperation

Course Outcomes:

After the completion of the course, Students will be able to-

1. Students will understand basic concepts in disaster management
2. Students will know relationship between geographical condition and disaster management
3. Students will get acquainted with standard operating procedure of disaster management.
4. Understand the value of preparedness of disaster.
5. Understand disaster risk reduction strategies.
6. Aware about international organizations involved in disaster management.
7. Aware about international disaster response and cooperation.

Unit No	Unit Name	Lectures
1	Introduction to Disaster Management 1.1 Concept and definition 1.2 Difference between hazard and disaster 1.3 Geographical Conditions and disasters 1.4 Classification of disasters	10
2	Basic Concepts in Disaster Management 2.1 Concept of Management 2.2 Aims and Objectives 2.3 Pre-Disaster Management 2.4 Post-Disaster management	10
3	Disaster management and measures 3.1 Phases of disaster management cycle 3.2 Importance of first aid 3.3 standard operating procedure of management on governmental level 3.4 Role of media in disaster management	10
4	Natural Disaster and management (Causes, effects and mitigation) 4.1 Earthquake 4.2 Volcano 4.3 Landslide 4.4 Tsunami 4.5 Cyclone 4.6 Flood	10
5	Man-made Disaster and management (Causes, effects and mitigation) 5.1 Deforestation 5.2 Forest fire 5.3 Soil Degradation 5.4 Terrorism 5.6 Major man-made disaster examples in India	10
6	Technologies for Disaster Management 6.1 Application of Modern Technologies for the emergency communication 6.2 Application of remote sensing, GIS and GPS in disaster management	10

Reference books

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

Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes**Class:** M.A./M.Sc. Geography I**Subject:** Geography**Course:** Geography of Disaster Management**Course Code:** PAGG 124**Weightage:** 1= Weak or low relation, 2= Moderate or partial relation, 3= Strong or direct relation

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

PO 2: Effective Citizenship and Ethics:

CO2- Student will be active advocates for policies that promote disaster resilience and social welfare. They can engage with policymakers, raise awareness about necessary regulations and standards, and hold authorities accountable. By participating in advocacy efforts, citizens contribute to the development of ethical and responsible policies that prioritize disaster risk reduction.

PO 3: Social Competence:

CO2: Students can effectively engage with their peers, teachers, and communities to raise awareness about disaster risks and preparedness measures. They can organize workshops, seminars, or awareness campaigns to educate others, promoting a culture of safety and preparedness in schools and beyond.

CO4: Understanding the role of international organizations in disaster management is important for student as it provides valuable insight into the global effort aimed as disaster preparedness, response and recovery.

CO5: Students will be aware of global issues including natural disasters and humanitarian crises in different parts of the world. Being informed about international disasters helps students appreciate the interconnectedness of the world and understand the need for global cooperation in disaster response.

CO6: Students learn to work together effectively, understanding the importance of each team member's role. They develop the ability to communicate, coordinate, and support one another during high-pressure situations, fostering a sense of camaraderie and mutual respect.

CO7: by increasing social awareness, students develop a strong foundation for social competence. These skills empower them to navigate complex social situations, build meaningful relationships, and positively influence their communities and the broader world

PO4:Disciplinary Knowledge:

CO3: Disaster risk reduction (DRR) strategies for students are essential to prepare them for potential emergencies and empower them to contribute to a safer environment.

PO7:Environmentand Sustainability:

CO5: Students can study how disaster risk reduction strategies align with the United Nations Sustainable Development Goals (SDGs). Understanding the interconnection between disaster resilience and goals such as clean water and sanitation, zero hunger, and life on land can help students appreciate the importance of these initiatives for environmental sustainability.

CO6: Participating in a rescue team within the context of environment and sustainability equips students with valuable skills and knowledge to respond to disasters while considering the environmental impact and promoting sustainability.

CO7: Encourage students to organize awareness campaigns within their schools and communities. They can create posters, videos, or presentations to educate others about environmental issues, such as deforestation, pollution, and endangered species.

PO8: Critical Thinking and Problem solving:

CO1: Critical thinking enables students to engage in scenario planning. By considering different disaster scenarios, students can analyze the potential consequences and develop strategic plans. They learn to anticipate challenges, identify resources, and formulate proactive strategies, fostering strategic thinking skills essential for effective disaster preparedness.

CO4: By engaging students in critical analysis and problem-solving activities related to international organizations in disaster management, educators can enhance their ability to think critically, evaluate information, and propose innovative solutions. These skills are invaluable, preparing students to address complex challenges and contribute meaningfully to disaster management efforts in the future.

Subject: Practical in Surveying**Subject Code: PAGG 125****No. of Credits: 04****Course Objectives:**

1. To introduce the fundamentals of Practical in Surveying.
2. To prepare the plans and maps that is for the representation of the measured plot of the area.
3. To become proficient in handling and using surveying equipment such as theodolite, total stations, levels, and GPS devices.
4. To develop skills in conducting field surveys, including setting up equipment, measuring distances, angles, elevations, and taking accurate readings.
5. To learn how to process survey data using software tools for analysis, interpretation, and presentation.
6. To develop problem-solving abilities by encountering and resolving real-world challenges faced during field surveys.
7. Gain proficiency in creating topographic maps using survey data, contour lines, and elevation measurements.

Course Outcomes:

After the completion of the course, -

1. Students will understand basic concepts in Practical in Surveying
2. Students will be able to prepare the plans and maps of the measured area.
3. Students will acquire the skills required to conduct field surveys independently, accurately measuring distances, angles, elevations, and collecting reliable data.
4. Students will demonstrate the ability to ensure accuracy and precision in survey measurements.
5. Students will be able to create topographic maps using survey data, contour lines, and elevation measurements.
6. Students will demonstrate problem-solving skills by effectively addressing challenges encountered during field surveys.
7. Students will understand creating topographic maps using survey data, contour lines, and elevation measurements.

Unit No	Unit Name	Lectures
1	Introduction to surveying 1.1 Definitions and methods 1.2 Benchmarks 1.3 Spot heights 1.4 Reduced levels 1.5 Interpolation and contouring	15
2	Dumpy Level Survey 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	15
3	Theodolite Survey 3.1 Various components and common terms used in Theodolite 3.2 Intersection method and Tachometric method	15
4	Total Station 4.1 Various components and common terms used in Total Station 4.2 Area and profile drawing	15

Reference books

- **AsisSarkar (2015):** Practical Geography, A Systematic Approach, Orient BlackSwan
- **Duggal, S.K. (2013):** Surveying Vol. 2, McGraw Hill Publication, NewYork.
- **Kanetkar, T.P. and Kulkarni, S.V. (2010):** Surveying and Leveling Vol. II, Pune Vidyarthi Publication,Pune.
- **Maslov, AV., Gordeev, A.V. and Batrakov, Yu.G. (1984):** Geodetic surveying, Mir Publishers,Moscow.
- **Rangwala, S.C. (2011):** Surveying and Leveling, Charotar Publishing HousePvt. Ltd. Anand, (Gujarat),India.
- **Punmia, B.C., Jain A. and Jain A. (2011):** Surveying, Vol. II. and III, Laxmi Publication - NewDelhi.

Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes**Class:** M.A. /M.Sc. Geography I**Subject:** Geography**Course:** Practical in surveying**Course Code:** PAGG 125**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.

Subject: Practical of Statistical Techniques for Geography**Subject Code: PAGG 126****No. of Credits: 04**

Course Objectives:

1. To introduce various techniques used in geography.
2. To learn and apply various statistical techniques for geographical problems.
3. Students will also learn how to plan a small group field visit and work in small groups in the field.
4. The goal to enhance the students Course experience with field visits and digital techniques.
5. The overall aim of the course is to provide an introduction to fundamental statistical methods used in geography.
6. Students will create clear and informative data visualizations to represent statistical findings
7. Students will learn exhibit proficiency in using statistical software to conduct data analysis.

Course Outcomes:

After the completion of the course, Students will be able to-

1. Students will understand the different techniques used in geography.
2. Students will able to apply various statistical techniques for geographical problems intheir research work.
3. Gain practical experience and awareness of some skills of field visits and data collection.
4. Develop skills by problem-solving, field and/or primary and secondary data collection, analysis and interpretation
5. Develop communication and interactive skills through group work.
6. Enhance ability to work as part of a team.
7. Students will be able to identify and understand various statistical tools commonly used in data analysis.

Unit No	Unit Name	Lectures
1	Introduction to Statistical Techniques in Geography 1.1 Introduction and applications of statistical techniques in Geography 1.2 Types of statistics: descriptive and inferential statistics Geographical data a) Primary and secondary data b) Spatial and temporal data c) Discrete and continuous data d) Grouped and ungrouped data 1.3 Scales of measurement: nominal, ordinal, interval and ratio	10
2	Descriptive Statistics 1.1 Introduction to descriptive statistics 1.2 Central tendency: mean, mode, median 1.3 Dispersion: variance and standard deviation Skewness and kurtosis 1.4 (Calculations of above parameters for ungrouped and grouped data)	08
3	Probability and Probability Distributions 3.1 Introduction to probability 3.2 The Normal Probability Distribution 3.3 The Binomial Probability Distribution 3.4 The Poisson Probability Distribution	10
4	Inferential Statistics 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	08
5	Correlation and Regression Analysis 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	10
6	Time Series Analysis 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	10

7	Fieldwork and Data Collection 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	04
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Reference Books:

- **AsisSarkar (2015):** Practical Geography, A Systematic Approach, Orient BlackSwan
 - **David, E. (1989):** Statistics for Geographers.
 - **Elhance, D.L., Elhance, V. and Aggarwal B.M. (2014):** Fundamentals of Statistics, KitabMahal, Allahabad.
 - **Hammond, R. and McCullagh, P. (1978):** Quantitative Techniques in Geography, Clarendon Press. Oxford, London.
 - **Karlekar, S. and Kale, M. (2006):** Statistical Analysis of Geographical Data, Diamond Publication, Pune.
 - **Liendsor, J. M. (1997):** Techniques in Human Geography, Routledge.
 - **Norcliffe, G.B. (1977):** Inferential Statistics for Geographers, Hutchinson, London.
 - **Rogerson, P.A. (2015):** Statistical Methods for Geography, SAGE Publication, London.
 - **Wheller, D., Shaw, G. and Barr, S. (2010):** Statistical Techniques in Geographical Analysis, David Fulton, Routledge, New York.
- Yeats, M. H. (1974):** An Introduction to Quantitative Analysis in Human Geography

Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes**Class:** M.A./M.Sc. Geography I**Subject:** Geography**Course:** Practical in statistical Techniques for geography**Course Code:** PAGG 126**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 cultivates 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.

