



Anekant Education Society's
Tuljaram Chaturchand College, Baramati
(Autonomous)

Two Year Degree Program in Geography
(Faculty of Science & Technology)

Revised Syllabus for

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

For Tuljaram Chaturchand College, Baramati

Choice Based Credit System Syllabus (2022 Pattern)
To be implemented from Academic Year 2023-2024

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

Preamble

Introduction:

Tuljaram Chaturchand College has decided to change the syllabus of various faculties from June, 2022. 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 of Tuljaram Chaturchand College, Baramati - Pune has prepared the syllabus of M. A. /M.Sc. Geography Semester - III 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.

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

❖ Aims and Objectives of the new curriculum:

1. To maintain updated curriculum.
2. To take care of fast development in the knowledge of Geography.
3. To enhance the quality and standards of Geography Education.
4. To provide a broad common frame work, for exchange, mobility and free dialogue across the Indian Geography and associated community.
5. To create and aptitude for Geography in those students who show a promise for higher studies and creative work in Geography.
6. To create confidence in others, for equipping themselves with that part of
7. 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):

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

Anekant Education Society's
Tuljaram Chaturchand College,
Baramati

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Board of Studies in Geography

From 2022-23 to 2024-25

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

M.A./M.Sc. GEOGRAPHY PROGRAMME CREDIT DISTRIBUTION PATTERN (110)

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	4 papers 4 x 4= 16 Credits	-	-	HR – I 2 Credit CS – I 2 Credit	Communication Skill 2 Credit	2 Practical's = 8 Credits	30
	II	4 papers 4 x 4= 16 Credits	-	-	CS – II 2 Credit	-	2 Practical's = 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	-	Introduction to Constitution 02 Credit	-	2 Practical's = 8 Credits Subject Related Skill Dev. Course 2 Credit	28
	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	8	2	32	110

Mandatory 14 additional / add-on credits for Post Graduate Programmes**Note:**

1. 12credits from Group - 1 are compulsory
2. Choose minimum 2credits 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
	Introduction to Constitution (Semester –III)		02 credit
	Subject Related skill development courses (Sem III)		02 credit
	Subject Related skill development courses (Sem IV)		02 credit
Group-2 Skill Component Courses	1. Subject Related Certificate Course (Sem. II)		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 co curricular 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. 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.

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

Sr. No.	Course Code	Core Compulsory Theory Paper (CCTP)	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	PAGG 121	Geoinformatics – I					04
One of the following according to specialization from CCTP							
2	PAGG 122 (A)	Coastal Geomorphology	-	-	04	-	04
	PAGG 122 (B)	Synoptic Climatology	-	-	04	-	
	PAGG 122 (C)	Population Geography	-	-	04	-	
One of the following according to specialization from CCTP							
3	PAGG 123 (A)	Fluvial Geomorphology	-	-	04	-	04
	PAGG 123 (B)	Monsoon Climatology	-	-	04	-	
	PAGG 123 (C)	Geography of Rural Settlements	-	-	04	-	
Optional Paper (CBOP) (1 Theory + 1 Practical)							
4	PAGG 124			Geography of Disaster Management	04		08
	PAGG 125			Practical in Surveying	04		
Core Compulsory Practical Paper (CCPP)							
5	PAGG 126					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
PAGG 231	Geoinformatics-II	-	-	04	-	04
PAGG 232	Research Methodology	-	-	04	-	04
One of the following according to specialization from CCTP						
PAGG 233 (A)	Tropical Geomorphology	-	-	04	-	04
PAGG 233(B)	Agro-Meteorology	-	-	04	-	
PAGG 233(C)	Urban Geography			04		
Choice Based Optional Paper (CBOP) (1Theory + 1Practical)						
PAGG 234			Practical in GIS	04	-	08
PAGG 235			Watershed Management	04	-	
One of the following according to specialization from CCPP						
PAGG 236 (A)					Practical in Geomorphology	04
PAGG 236 (B)					Practical in Climatology	
PAGG 236(C)					Practical in Population and Settlement Geography	
Total Credits of Semester -III						24

Semester – IV

Course Code	Core Compulsory Theory Paper (CTTP)	Choice Based Optional Paper (CBOP)	Theory / Practical	Credit	Core Compulsory Practical Paper (CCPP)	Credit
PAGG 241	Geography of India	-	-	-	-	04
PAGG 242	Oceanography	-	-	-	-	04
PAGG 243	Geographical thoughts	-	-	-	-	04
Choice Based Optional Paper (CBOP) (1Theory + 1Practical)						
PAGG 244			Geography of Soils	04		04
PAGG 245			Practical in Remote Sensing	04		
Core Compulsory Practical Paper (CCPP)						
PAGG 246					Dissertation / Research Project	04
Total Credits of Semester - IV						24

Department of Geography
Course Structure for M.A / M.Sc. Geography
with effect from Academic Year 2022-2023

Sem.	Paper Code	Title	No. of Credits
I	PAGG 111	Principles of Geomorphology	04
	PAGG 112	Principles of Climatology	04
	PAGG 113	Principles of Economic Geography	04
	PAGG 114	Principles of Population and settlement Geography	04
	PAGG 115	Practical in Physical Geography	04
	PAGG 116	Practical in Human Geography	04
II	PAGG 121	Geoinformatics I	04
	PAGG 122 (A)	Coastal Geomorphology	04
	PAGG 122 (B)	Synoptic Climatology	04
	PAGG 122 (C)	Population Geography	04
	PAGG 123 (A)	Fluvial Geomorphology	04
	PAGG 123 (B)	Monsoon Climatology	04
	PAGG 123 (C)	Geography of Rural Settlement	04
	PAGG 124	Geography of Disaster Management	04
	PAGG 125	Practical In Surveying	04
	PAGG 126	Practical in Statistical Techniques for Geography	04
III	PAGG 231	Geoinformatics II	04
	PAGG 232	Research Methodology	04
	PAGG 233 (A)	Tropical Geomorphology	04
	PAGG 233 (B)	Agro-Meteorology	04
	PAGG 233 (C)	Urban Geography	04
	PAGG 234	Practical in GIS	04
	PAGG 235	Watershed Management	04
	PAGG 236 (A)	Practical in Geomorphology	04
	PAGG 236 (B)	Practical in Climatology	04
	PAGG 236 (C)	Practical in Population and Settlement Geography	04
PAGG SEC 01	Advanced Techniques in Google Earth	02	
IV	PAGG 241	Geography of India	04
	PAGG 242	Oceanography	04
	PAGG 243	Geographical Thoughts	04
	PAGG 244	Geography of Soils	04
	PAGG 245	Practical in Remote Sensing	04
	PAGG 246	Dissertation / Research Project	04
	PAGG SEC 02	Advanced Techniques in Google Map	02

M.A. /M.Sc. Geography II SEM IV
Subject: PAGG 241 Geography of India

No. of Credits: 04

Periods: 64

Course Objectives:

1. To make students well aware of the location extend and neighboring countries of India and relationship with them.
2. To understand geological structure and physiographic divisions of India
3. To acquaint the knowledge of climate of India and its impact on Indian agriculture.
4. To understand drainage basin of India, major river and their tributaries and area drained by them.
5. To understand the mechanism of monsoon, active and break period of monsoon.
6. To understand the distribution of soil and forest cover in India.
7. To understand the types minerals and energy resources in India.

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

- CO1.** Aware of the location, extend and neighboring countries of India and relationship with them.
- CO2.** Understand the geological structure and physiographic divisions of India and its important.
- CO3.** Understand the different seasons, climate of India and its impact on Indian agriculture
- CO4.** Understand drainage basin of India, Major River and their tributaries and area drained by them.
- CO5.** Understand the mechanism of monsoon, active and break period of monsoon, and trend of monsoon in past years.
- CO6.** Aware about distribution of soil in India and suitability of that soil for specific crops, also forest cover in India.
- CO7.** Understand the types of minerals and energy resources in India and its impact on development industrialization in India

Topics and Learning points

Unit 1: Location, Extend and Physiographic divisions of India	Teaching Hours
1.1 Geographical and relative location of India	12
1.2 Frontiers of India and Neighboring Countries	
1.3 The northern mountains	
1.4 The north Indian Plain	
1.5 The peninsular plateau	
1.6 The coastal lowlands	
1.7 The islands	
 Unit 2: Drainage System	 14
2.1 Himalayan drainage systems	
1. Ganga River System	
2. Brahmaputra River System	
3. Indus River System	
2.2 Peninsular drainage system	
A. East Flowing Rivers:	
1. Goavari River System	
2. Krishna River System	
3. Mahanadi River System	
B. West Flowing Rivers:	
1. Narmada River System	
2. Tapi River System	
3. Mahi River System	
 Unit 3: Climate	 12
3.1 The winter Seasons & Associated weather conditions	
3.2 The summer Seasons & Associated weather conditions	
3.3 The rainy/monsoon Seasons & Associated weather conditions	
3.4 The retreat monsoon Seasons & Associated weather conditions	
3.5 Origin and mechanism of monsoon	

Unit 4: Soil and Forest**10**

- 4.1 Major soil types and their distribution in India
- 4.2 Soil degradation and soil conservation
- 4.3 Main forest types and their distribution in India
- 4.4 Deforestation and conservation of forest
- 4.5 National Park and Sanctuary in India

Unit 5: Minerals and Energy Resources**12**

- 5.1 Distribution and Utilization of Minerals
- 5.2 Distribution and Utilization of Energy Resources
- 5.3 Hydro electric power projects in India
- 5.4 Hydro electric power projects in India
- 5.5 Thermal Power projects in India

Reference:

1. Agrawal A. N. (2019): "Indian economy, Developmental Problems and policies" New Age International Pvt. Ltd.
2. Bhende, Asha A and Kanitkar Tara (2015): "Principles of Population Studies", Himalaya Pub. House, New Delhi.
3. Chandana R. C. (2016): "Geography of population", Kalyani Publishers, New Delhi.
4. Chopra S. N. - India, an Area Study.
5. Deshpande C. D. (1992): "India: A Regional Interpretation", Indian Council of Social Science Research and National Book Centre, New Delhi
6. Dubey and Negi - Economic Geography of India.
7. Gopal Singh (1976): Geography of India" Atma Ram Pub., Delhi
8. Khullar D. R. (2018) : "India: a Comprehensive Geography" Kalyani Publishers
9. Majid Husain (2008): "Geography of India", Tata McGraw Hill, New Delhi

Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: M.A/M.Sc. II

Subject: Geography

Course: Geography of India

Course Code: PAGG241

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

Justification for the mapping**PO 2: Effective Citizenship and Ethics:**

CO1- Understanding India's location, extent, and relationships with neighboring countries is essential for effective citizenship and ethical considerations in regional and international affairs. Effective citizens can play a significant role in promoting peace, cooperation, and ethical practices in India's interactions with its neighbors.

PO 3: Social Competence:

CO1- Having knowledge of India's geography and its relationships with neighbouring countries is a critical aspect of social competence. It helps individuals navigate cultural diversity, engage effectively in international relations, promote peaceful solutions to conflicts, and foster cross-cultural understanding, which are all essential components of social competence in an increasingly interconnected world.

PO 4: Disciplinary Knowledge:

CO 2- Understanding the geological structure and physiographic divisions of India is a fundamental aspect of disciplinary knowledge in geography. This knowledge forms the foundation for comprehending India's landforms, natural resources, and environmental processes.

CO 4 - knowledge of India's drainage basin, major rivers, and their tributaries is a critical component of disciplinary knowledge in geography. It enables students to analyze hydrological, environmental, cultural, and developmental aspects related to the country's river systems.

CO 5 The mechanism of the monsoon, along with its active and break periods, is a vital component of disciplinary knowledge in geography. It provides a basis for understanding the climatic, environmental, and societal aspects of this significant meteorological phenomenon in the Indian subcontinent and other regions affected by monsoons.

CO 6 The distribution of soil and forest cover in India is a vital component of disciplinary knowledge in geography. It provides a foundational understanding of the country's environmental diversity, ecosystems, and natural resource utilization, which are integral to various geographical subfields and critical for informed decision-making in land use and conservation.

CO 7- Types of minerals and energy resources in India are essential for geographical knowledge, particularly in the fields of resource geography, economic geography, environmental geography, energy geography, and geopolitics. These resources are vital for India's economic development, energy security, and environmental sustainability.

PO 7: Environment and Sustainability:

CO 3- Knowledge of India's climate and its impact on agriculture, the environment, and sustainability is integral to geographical studies. It informs agricultural practices, environmental conservation efforts, and sustainable development strategies, recognizing the role of climate in shaping India's geography and influencing the well-being of its people.

M.A. /M.Sc. Geography II SEM IV**Subject: PAGG242 Oceanography**

No. of Credits: 04

Periods: 64

Course Objectives:

1. To understand the basic knowledge of Oceanography.
2. To study coastal geomorphology by focusing on how coastal regions are formed.
3. To study processes of waves, tides, and streams go through to create boulders, coral
4. To understand importance of coastal zone with future resources approach.
5. To know the geological, physical, chemical and biological features and process that affect the surface of the ocean.
6. To differentiate between underwater formation, sea water formations, sea water composition and qualities.
7. To develop an appreciation for the diversity and importance of life in the ocean.

Course Outcomes:**By the end of the course, students will be able to:****CO1.** Understand the diversity and importance of life in the ocean**CO2.** Understand the various processes related to oceanography**CO3.** Understand the relationship between man and the ocean.**CO4.** Identifies physical features of the sea floor such as its topography, sediment type and distribution or available resources.**CO5.** Describe the properties of water, emphasizing how this properties change in presence of salt.**CO6.** Evaluate threats to marine or coastal environment.**Topics and Learning Points****UNIT 1: Introduction to Oceanography****Teaching Hours**

1.1 Definition and Meaning of Oceanography

12

1.2 Principles Nature and Scope of Oceanography

1.3 Age and origin of Oceans

1.4 Morphology of Marine Ocean Bottom

UNIT2: Ocean Waves and Tides **12**

- 2.1 Definition and terms
- 2.2 Wave Theories
- 2.3 Classification of Waves and Tides
- 2.4 Tidal Currents, Rip Currents

UNIT 3: The Ocean **12**

- 3.1 Continental Margin: Continental shelves and slopes
- 3.2 Oceanic Ridges and Rises
- 3.3 Abyssal Plains, Oceanic Trenches
- 3.4 Coral Reefs and Atolls

UNIT 4: Marine Sediments **12**

- 4.1 Lithogenous Particles (Derived from Rocks)
- 4.2 Biogenous Particles (derived from organisms)
- 4.3 Hydrogenous Particles (derived from Water)
- 4.4 Oceanic Ooze

UNIT 5: Oceanic Pollution **12**

- 5.1 Etiology of Marine & Oceanic Pollution
- 5.2 Possible Natural Disturbances Causing Pollution in Oceans
- 5.3 Anthropogenic Activities Resulting in Oceanic Pollution
- 5.4 Known Remedial Measures for Pollution at Sea & Oceanic Level

References:

1. Basu S.K. (2003) (ed): Handbook of Oceanography, Global Vision, Delhi.
2. Davis Richard A. (1972): Oceanography, Addition Wesley Publishing Co.
3. Garrison Tom (1999): Oceanography, Brooks/ Cole Wadsworth, New York.
4. Garrison Tom (2004): Essentials of Oceanography. Thompson, Australia.
5. Grant Gross M. (1982): Oceanography, Prentice hall, Ince, New Jersey.
6. King Cuchlain A. M (1962): Oceanography for Geographers (ED) Edward Arnold.

7. Sharma & Vatal (1962): Oceanography for Geographers. Chaitanya Publishing House, Allahabad
8. Thurman Harold V. (1985): Introductory Oceanography. Bell & Howell Co. London.
9. Weisberg J. and Howard P. (1974): Introductory Oceanography. McGraw Hill, Kogakusha, Tokyo.

Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: M.A/M.Sc. II

Subject: Geography

Course: Oceanography

Course Code: PAGG242

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

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

Justification for the mapping

PO1: Research-Related Skills and Scientific temper

Course outcome Co4, Co5, Co6 are contributes to identifying physical features of the seafloor, such as its topography, sediment type and distribution, and available resources, is an essential research skill in the field of geography, particularly in oceanography and marine geology. This skill is crucial for understanding the Earth's surface and the distribution of resources in the ocean.

PO2: Effective Citizenship and Ethics

CO3 requires students to acquire effective citizenship in the context of oceanography involves taking responsibility for the well-being of our oceans. This includes understanding the impact of human activities on marine ecosystems, such as pollution, overfishing, and habitat destruction, and actively participating in efforts to protect and preserve these environments.

PO4: Disciplinary Knowledge

CO1, CO2, CO3, CO4, CO5 contribute to the development of students' disciplinary knowledge in oceanography. For example, CO1 requires students to understanding the diversity and importance of life in the ocean is a crucial aspect of disciplinary knowledge in the field of geography, particularly in the sub-discipline of marine geography. The ocean is teeming with a wide array of life forms, from the smallest microorganisms to the largest marine mammals, and this diversity plays a vital role in shaping our planet and human societies.

CO2 outcome indicate disciplinary knowledge in geography related to oceanography encompasses a broad spectrum of processes, from the physical dynamics of ocean waters to the chemical and biological interactions, geological features, and the human and environmental impacts on the world's oceans. This knowledge is crucial for addressing environmental challenges, promoting sustainable development, and effectively managing coastal and marine resources.

CO3 outcome indicate The relationship between humans and the ocean is a critical area of disciplinary knowledge in oceanography. Geographers study this relationship from various perspectives, encompassing social, economic, environmental, and cultural dimensions. Here's an overview of the disciplinary knowledge in geography related to the relationship between man and the ocean

CO4 requires student to identifying physical features of the seafloor involves an interdisciplinary approach that combines geological, oceanographic, and geospatial techniques. Geographers and oceanographers work together to collect, analyze, and interpret data to better understand seafloor topography, sediment types, and the distribution of resources. This knowledge is crucial for scientific research, resource management, environmental protection, and various applications in marine geography.

CO5 outcome indicate water is a vital substance with unique properties, and its characteristics can significantly change in the presence of salt. In geography, an understanding of these properties is crucial when studying various aspects of the Earth's physical and human systems. Here are some key properties of water and how they change in the presence of salt.

PO7: Environment and Sustainability:

CO2 and CO5 contribute to the knowledge of and need for sustainable development. For example, CO2 requires students to learn the environment, and sustainability is crucial for students studying geography and related fields. Oceanography is the scientific discipline that focuses on the study of the world's oceans, and it plays a significant role in environmental and sustainability considerations.

CO5 indicates that understanding how the properties of water change in the presence of salt is fundamental to studying the physical and chemical characteristics of seawater. This knowledge is essential for addressing environmental and sustainability challenges in oceanography, including the effects of climate change, ocean acidification, and the preservation of marine ecosystems. Sustainable practices in oceanography aim to maintain the delicate balance of marine environments, considering the unique properties of saltwater.

PO8: Critical Thinking and Problem solving

CO6 contribute to the development of students' critical thinking and problem-solving skills. For example, CO6 require students to Evaluating threats to marine or coastal environments is a crucial aspect of oceanography, as it helps us understand and address the challenges facing these ecosystems. Critical thinking is essential in assessing these threats and formulating effective solutions.

M.A. /M.Sc. Geography II SEM IV**Subject: PAGG243 Geographical Thoughts**

No. of Credits: 04

Periods: 64

Course Objectives:

1. To make students well aware about historical development of geography as subject.
2. To understand evolutionary theories of universe and earth given by different scholars
3. To acquaint the knowledge of mathematical and geometrical theorems given by Greeks scholars.
4. To understand the impact of exploration in the matter in subject of geography.
5. To understand the dualism in geography and the correlation of different branches of geography to each other.
6. To study different paradigm, approaches and models in geography.
7. To understand the recent trend and new technologies in geography.

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

- CO1.** Understand about historical development of geography as subject.
- CO2.** Understand the evolutionary theories of universe and earth given by different scholars.
- CO3.** Acquaint with the knowledge of mathematical and geometrical theorems given by Greeks scholars
- CO4.** Understand the impact of exploration in the matter of subject geography.
- CO5.** Understand about dualism in geography and the correlation of different branches of geography to each other.
- CO6.** Understand the paradigm, approaches and models in geography.
- CO7.** Understand the recent trend and new technologies in geography such as Remote sensing and GIS.

Topics and Learning points

Unit 1: Historical Development of Geographical Thoughts	Teaching Hours
1.1 Greek contribution to Physical and Mathematical Geography	16
1.2 Roman contribution to Geography	
1.3 Arab contribution to Geography	
1.4 Indian contribution to Geography	
1.5 Contributions of Explorers and its impact	
 Unit 2: Dualism in Geography	 10
2.1 Concept and Meaning of Dualism	
2.2 Determinism and Possibilism	
2.2 Systematic versus Regional Geography	
2.3 Physical versus Human Geography	
 Unit 3: Paradigms, approaches and Models in Geography	 10
3.1 Concept and Meaning of Paradigms	
3.2 Paradigms in Geography	
3.3 Evolutionary approach and its impact on Geography	
3.4 Types of Models used in Geographical Studies	
 Unit 4: Conceptual Development and Major Revolutions	 12
4.1 Areal Differentiation	
4.2 Regional Synthesis	
4.3 Locational and Spatial Analysis,	
4.4 System analysis	
4.5 Geo-informatics revolution	
 Unit 5: Trends in Geography	 12
5.1 Humanistic and Welfare Geography	
5.2 Marxist Geography,	
5.3 Radical Geography,	
5.4 Geography of Gender	

Reference:

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Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: M.A/M.Sc. II

Subject: Geography

Course: Geographical Thoughts

Course Code: PAGG 243

Weight age: 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				2
CO 2				2				
CO 3	2							2
CO 4				2				
CO 5								2
CO 6	2							1
CO 7	2							2

Justification for the Mapping

PO 1: Research Related Skill:

CO3- Knowledge of mathematical and geometrical theorems will enhance the quality of research.

CO6- Various paradigm, approaches and models in geography will helps students in research activity to develop new methodologies.

CO7- recent trend and new technologies in geography such as Remote sensing and GIS will be beneficial geographical research in terms of geospatial analysis.

PO 4: Disciplinary Knowledge:

CO 1- Understanding the historical development of geography can be a valuable educational tool for fostering disciplinary knowledge among students.

CO 2- Teaching evolutionary theories of the universe and Earth can indeed enhance students' awareness and understanding of the subject matter. These theories provide a comprehensive framework for explaining the development and history of the cosmos and our planet, fostering subject knowledge in various ways

CO 4- Exploration and conceptual knowledge in the subject of geography are closely related and can be mutually reinforcing.

PO 8: Critical Thinking and Problem solving:

CO 1- The study of the historical development of geography can significantly enhance critical thinking and problem-solving skills.

CO 3- Mathematical and geometrical theorems provide students with tools to analyze spatial relationships, distances, and shapes. They can apply these principles to solve spatial problems in geography, such as calculating distances, understanding map projections, or evaluating the layout of urban areas.

CO 5- By exploring the dualism in geography, students learn to critically analyze the division between physical and human geography. They can examine the historical and conceptual reasons behind this division and question whether it accurately reflects the complex interactions between humans and their environment.

CO 6- Different paradigms, such as positivism, humanism, and critical theory, provide students with diverse theoretical lenses through which they can view geographic phenomena. Studying these paradigms encourages critical analysis as students evaluate the strengths and limitations of each perspective.

CO 7- Remote sensing provides vast amounts of spatial data collected from satellites, drones, and other sensors. Students must engage in critical thinking to analyze and interpret this data effectively. They learn to identify patterns, anomalies, and trends, which are essential skills in geographic problem-solving.

M.A. /M.Sc. Geography II SEM IV**Subject: PAGG244 Geography of Soil**

No. of Credits: 04

Periods: 64

Course Objectives:

1. To understand soil as key component of the earth's biosphere and climate system.
2. To get information about the soil genesis and provide information about the soil resources of area.
3. To foresee global consequences of direct and indirect impact of human activity on soil condition.
4. To visualize soil as a system of interacting components with interrelated physics, chemistry and biology
5. To studies the factor that influence soil formation and geographic distribution of soil.
6. To recognise the significance of soil as a resource.

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

- CO1.** Understand the concept and principles of soil formation.
- CO2.** Understand the role of essential nutrient for plant growth and development.
- CO3.** Understand the impact of man as an active agent of soil transformation, erosion and degradation.
- CO4.** Understand the students to realize soil and environmental problems.
- CO5.** Understand the significance of soil conservation and methods of soil reclamation.
- CO6.** Understand knowledge about the character and profile of different soil type

Topics and Learning Points**UNIT 1: Introduction to Geography of Soil****Teaching Hours**

- | | |
|--|----|
| 1.1 Definition | 12 |
| 1.2 Nature and Scope of Soil Geography | |
| 1.3 Development of Geography of Soil | |
| 1.4 Soil as a Natural Resource | |
| 1.5 Pedology | |

UNIT 2: Soil Formation and Soil Profile	12
2.1 Factors of Soil Formation:	
2.2 Weathering and Pedogenesis	
2.3 Soil Profile: Definition and Structure	
2.4 Primary and Secondary Minerals	
UNIT 3: Physical properties of Soils	12
3.1 Texture, Structure, Moisture, Colour of soil	
3.2 Bulk density, Porosity and Permeability of Soil	
3.3 Water holding capacity of soil	
3.4 Field capacity and Wilting point	
UNIT 4: Chemical properties of Soils	12
4.1 Clays minerals, Cation- Anion exchange	
4.2 Humus and Organic matter	
4.3 C:N ratio	
4.4 pH and NPK Factors influencing ion exchange and its significance	
UNIT 5: Problems related to soil and Soil Conservation	12
5.1 Soil Problems: Soil Pollution, Acidification, salinization and Soil health	
5.2 Soil Conservation: Definition and various methods of Soil Conservation	
5.3 Soil Conservation in India	
5.4 Role of RS and GIS in Soil Conservation	

References:

1. A.S. Gustafson, (2007): "Soils and Management" Published by Agrobios (India).
 2. Brady, N. C., and Weil, R. R. (2008): The Nature and Properties of Soils, Prentice Hall, New Jersey
 3. Bridges, E. M. and Davidson, D. A. (1982): Principles and Applications of Soil Geography, Longman Group, London.
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Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: M.A/M.Sc. II

Subject: Geography

Course: Geography of Soil

Course Code: PAGG 244

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

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

Justification for the mapping

PO1: Research-Related Skills and Scientific temper

CO2 and CO6 contribute to the development of student's research-related skills and scientific temper. For example, CO2 requires students to learn research-related skills and maintaining a scientific temperament, you can make valuable contributions to the understanding of essential nutrients in soil geography and their impact on plant growth and development.

CO6 and indicates research-related skills and maintaining a scientific temperament, students can contribute to a deeper understanding of the character and profile of different soil types in geography, which is essential for sustainable land use, environmental conservation, and agricultural practices.

PO2: Effective Citizenship and Ethics:

CO5 requires students are essential to help them understand the significance of soil conservation and methods of soil reclamation in soil geography. Students can nurture ethical and responsible citizenship among students, fostering an understanding of the significance of soil conservation and soil reclamation in soil geography. This, in turn, contributes to a more sustainable and environmentally conscious society.

PO4: Disciplinary Knowledge

CO1, CO2, CO5 and CO6, contribute to the development of students' trans-disciplinary knowledge. For example, CO1 requires students to know the concept and principles of soil formation in geography involve a holistic understanding of the dynamic processes that shape the Earth's crust and provide the foundation for ecosystems and human societies. Students should learn to analyze and interpret soils in various environments and recognize the importance of sustainable soil management for the well-being of the planet.

CO2 indicates that students to understand the role of these essential nutrients in plant growth and development is vital for geography of soil studies, as the availability of these nutrients in the soil directly affects the type of vegetation that can thrive in a given area. Soil properties, nutrient content, and pH levels can vary widely across geographic regions, influencing the types of plants that can be sustained and the agricultural practices that are suitable for a particular location.

CO5 requires students understand the significance of soil conservation and the various methods of soil reclamation are essential for students studying soil geography. These practices are not only important for sustainable agriculture and land use but also for the preservation of natural ecosystems and the overall health of the environment.

CO6 indicates that students studying soil geography should develop a thorough understanding of the character and profile of different soil types. Soil profiles are typically characterized by distinct horizons, and these horizons can vary depending on the soil type and the local environment.

PO7: Environment and Sustainability

CO1, CO3, CO4 and CO5 contribute to the knowledge of and need for sustainable development. For example, CO1 requires students to understand the concept and principles of soil formation is crucial when studying environmental science and sustainability. Soil formation, also known as pedogenesis, is a complex process influenced by several key principles and factors.

CO3 and CO4 require students to understand the impact of human activities on soil transformation, erosion, and degradation is crucial for sustainable environmental management. Sustainable land use practices, reforestation, soil conservation methods, and responsible land development are essential for mitigating these negative effects and protecting soil resources for future generations.

CO5 indicates that students to know environmental science and sustainability, it is essential for students to understand the significance of soil conservation and methods of soil reclamation. Soil conservation and reclamation are vital components of sustainable land management.

PO8: Critical Thinking and Problem solving

CO3 and CO4 contribute to the development of students' critical thinking and problem-solving skills. For example, CO3 and CO4 require students to understand the impact of human activities on soil and the environment and by realizing the interconnected nature of these issues, students can develop critical thinking and problem-solving skills essential for addressing and finding solutions to complex environmental challenges.

M.A. /M.Sc. Geography II SEM IV**Subject: PAGG245 Practical in Remote Sensing**

No. of Credits: 04

Periods: 64

Course Objectives:

1. To understand the field of Geoinformatics.
2. To provide understanding of fundamentals of GIS, Remote sensing and their applications.
3. To prepare skilled manpower to fulfill the dream of Digital India.
4. To encourage the research and development in the field of Geoinformatics.
5. To know the basic concepts and fundamentals of physical principles of remote sensing.
6. To create a firm basis for successful integration of remote sensing in any field of application.

Course Outcomes:**By the end of the course, students will be able to:****CO1.** Understand about remote sensing.**CO2.** Understand the satellite remote sensing**CO3.** Do the image processing.**CO4.** Understand an idea about satellite image interpretation.**CO5.** Understand different type of remote sensing system for various applications.**CO6.** Understand Operational skills necessary to acquire remote sensing data and learn to extract information from them.**CO7.** Develop skill set to deal with different types and forms of satellite data.**Topics and Learning Points****UNIT 1: Map Scale and Satellite Images****Teaching Hours**

1.1 Definition and Meaning

16

1.2 Types of Scale

1.3 Band Combination

1.4 Band Ratios

UNIT 2: Image Processing	16
2.1 Supervised Classification	
2.2 unsupervised Classification	
2.3 Image Correction Method	
UNIT 3: Spatial Analysis Tools	16
3.1 Vector Data	
3.2 Raster Data	
3.3 Indices	
UNIT 4: Indices	16
4.1 Normalized Difference Vegetation Index (NDVI)	
4.2 Normalized Difference Water Index (NDWI)	
4.3 Soil Adjusted Vegetation Index (SAVI)	
4.4 Water Indices (WI)	

References:

1. Brooks, K. N., Folliott, P. F., & Magner, J. A. (2012). Hydrology and the Management of Watersheds, Oxford:Wiley-Blackwell.
2. Cech, T. V. (2003). Principles of Water Resources: History, Development, Management, and Policy, New York: John Wiley and Sons.
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6. Pranjape, S., Joy, K. J., Machado, T., Varma, A. K., & Swaminathan, S. (1998). Watershed-Based Development, New Delhi: Bharat Gyan Vigyan Samithi.
7. Singh, R. J. (2000). Watershed Planning and Management. Bikaner: Yash Publishing House.
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Choice Based Credit System Syllabus (2022 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: M.A/M.Sc. II

Subject: Geography

Course: Practical in Remote Sensing

Course Code: PAGG 245

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

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

Justification for the mapping

PO1: Research-Related Skills and Scientific temper

CO2, CO4, CO6 and CO7 contribute to the development of student's research-related skills and scientific temper. For example, CO2 requires students understanding satellite remote sensing is crucial for students developing research-related skills and scientific temper, especially in fields such as Earth and environmental sciences. Satellite remote sensing involves the use of orbiting satellites to acquire data and information about the Earth's surface, atmosphere, and oceans.

CO4 indicates that to understand satellite image interpretation is a fundamental skill for students studying remote sensing and conducting research in related fields. Satellite images are a valuable source of information about the Earth's surface, and the ability to interpret them correctly is essential.

CO6 and CO7 indicates that students can effectively acquire remote sensing data, process and analyze it, and extract valuable information for various research applications in fields such as environmental science, geospatial analysis, agriculture, and natural resource management. These skills also foster a scientific temper by promoting a systematic and analytical approach to understanding the Earth's surface through remote sensing technology.

PO4: Disciplinary Knowledge

CO1, CO2, CO3, CO4, CO5 and CO6, CO7 are contributing to the development of students' trans-disciplinary knowledge. For example, CO1 and CO2 require students to know remote sensing and satellite remote sensing is essential for students to effectively use these technologies in their research, data analysis, and applications across a variety of disciplines. This knowledge empowers them to make informed decisions and contributions in their respective fields.

CO3 indicates that students to know image processing in remote sensing involves a series of techniques and procedures for enhancing, analyzing, and extracting valuable information from remotely sensed imagery. These skills are particularly important for students studying fields such as geography, environmental science, geology, and agriculture.

CO4 requires students to understand the satellite image interpretation is a valuable skill for students in various disciplines, as it enables them to analyze and extract information from satellite imagery, make informed decisions, and contribute to research and applications in their respective fields. This skill also fosters scientific temper by encouraging a systematic and analytical approach to image analysis and interpretation.

CO5 indicates that students to understand these different remote sensing systems and their applications is essential for students as it enables them to choose the appropriate technology for specific research or practical needs.

CO6 and CO7 requires students to know these operational skills and knowledge about different types of satellite data are valuable for students pursuing research, environmental monitoring, and geospatial analysis in various disciplines. They empower students to work effectively with satellite data, extract valuable information, and make informed decisions for

their research

PO8: Critical Thinking and Problem solving

CO4 contribute to the development of students' critical thinking and problem-solving skills. For example, CO4 require students to understand satellite image interpretation in remote sensing from a critical thinking and problem-solving perspective is essential for students. It enables them to analyze complex data, identify patterns, and make informed decisions.

M.A. /M.Sc. Geography II SEM IV**Subject: PAGG-SEC-02: Advance Techniques in Google Map**

No. of Credits: 02

Periods: 32

Course Objectives:

1. To discover how to share custom maps with individuals and groups effectively.
2. To gain proficiency in importing and exporting data for use in custom maps.
3. To explore the use of Google Maps in websites, applications, and e-commerce platforms.
4. To understand how to implement geo-location services for business needs.
5. To instruct students on using Google Maps on smart phones and tablets for location-based services.
6. To explore location-based services, check-ins, and their relevance in mobile applications
7. To demonstrate the integration of Google Maps with other mobile apps and services.

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

- CO1.** Share custom maps with others while managing permissions and access.
- CO2.** Import and export geospatial data to and from custom maps for different purposes.
- CO3.** Integrate Google Maps into websites, mobile applications, and location-based services.
- CO4.** Implement geo-location features to enhance business operations and user experiences
- CO5.** Effectively use Google Maps on mobile devices for navigation and location-based services.
- CO6.** Implement check-ins and location-based features in mobile applications.
- CO7.** Integrate Google Maps with various other mobile apps and services to enhance functionality.

Topics and Learning points

Unit 1: Customizing Google Maps	Lectures
1.1 Creating custom maps with My Maps	10
1.2 Adding and editing markers and routes	
1.3 Sharing custom maps with others	
1.4 Importing and exporting data	
 Unit 2: Google Maps for Business	 10
2.1 Introduction to Google Maps platform	
2.2 Using maps in websites and applications	
2.3 Implementing geo-location services	
2.4 Adding business on Google Maps	
 Unit 3: Mobile Applications and Integration	 12
3.1 Using Google Maps on smart phones and tablets	
3.2 Location based services and check-ins	
3.3 Integrating Google maps with other apps and services	
3.4 Privacy and location setting	

Recommended Textbooks Websites:

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9. [Google Maps Platform Documentation](https://developers.google.com/maps/documentation) - Official documentation for developers using Google Maps API.<https://developers.google.com/maps/documentation>
10. [Google Maps JavaScript API Tutorial](https://developers.google.com/maps/get-started) - Official guide to getting started with the Google Maps JavaScript API.<https://developers.google.com/maps/get-started>
11. [OpenStreetMap](https://www.openstreetmap.org/#map=4/21.84/82.79) - A collaborative mapping project that provides open and free geographic data.<https://www.openstreetmap.org/#map=4/21.84/82.79>