



Anekant Education Society's
Tuljaram Chaturchand College of Arts, Science and Commerce,
Baramati
(Autonomous)

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

Syllabus for
M.A. /M.Sc. Geography Part-II SEM - IV

Choice Based Credit System Syllabus
To be implemented from Academic Year 2019-2020
(2019 Pattern)

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

Introduction:

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

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

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

Aims and Objectives of the New Curriculum:

1. To Maintain an Updated Curriculum:

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

2. To Address Rapid Developments in Geographic Knowledge:

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

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

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

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

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

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

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

6. To Instill Confidence for Further Exploration:

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

Programme Outcomes (POs) for M.A. Geography:**1. Research-Related Skills and Scientific Temper:**

Develop the ability to analyze scientific literature, formulate and test hypotheses, and identify relevant sources for research. Acquire skills to plan and write research papers while emphasizing academic integrity, research ethics, intellectual property rights, and plagiarism issues.

2. Effective Citizenship and Ethics:

Demonstrate a commitment to social equity and national development, acting with awareness of moral and ethical issues while adhering to professional ethics and responsibilities.

3. Social Competence and Communication Skills:

Show the ability to consider diverse viewpoints and present complex ideas clearly in both written and oral formats. Communicate effectively using appropriate media, fostering interactive skills to meet global competencies and facilitate group conclusions.

4. Disciplinary Knowledge:

Exhibit comprehensive knowledge and a strong theoretical foundation in the field of Geography.

5. Personal and Professional Competence:

Function independently and collaboratively within a team to achieve objectives across interdisciplinary fields. Cultivate interpersonal skills, self-motivation, adaptability, and a commitment to professional ethics.

6. Self-Directed and Life-Long Learning:

Embrace a mindset of lifelong learning, pursuing self-determined goals within the context of socio-technological changes and engaging in independent, ongoing education.

7. Environment and Sustainability:

Understand the societal and environmental implications of scientific solutions and recognize the importance of sustainable development.

8. Critical Thinking and Problem Solving:

Identify and analyze problems by examining surrounding situations holistically, generating viable solutions. Demonstrate critical thinking skills by evaluating scientific texts and themes, applying analytical and lateral thinking to design effective solutions.

Tuljaram Chaturchand College, of Arts, Science and Commerce Baramati

(Autonomous)

Board of Studies in Geography

From 2019-20 To 2021-22

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

Semester – I

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

Semester – II

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

Semester – III

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

Semester – IV

	Core Compulsory Theory Paper (CCTP)	Choice Based Optional Paper (CBOP)	Theory / Practical	Credit	Core Compulsory Practical Paper (CCPP)	Credit
GEO-5401	Geography of India	-	-	-	-	04
GEO-5402	Oceanography	-	-	-	-	04
GEO-5403	Biogeography	-	-	-	-	04
Choice Based Optional Paper (CBOP) (1Theory + 1Practical)						
		GEO-5411	Geography of Soils	04		08
		GEO-5412	Geostatistics	04		
		GEO-5413	Political Geography	04		
		GEO-5414	Regional Planning	04		
		GEO-5415	Tourism Geography	04		
		GEO-5416	Social Geography	02		
		GEO-5417	Interpretation of Topographical Maps & Village Survey / Project work	04		
Core Compulsory Practical Paper (CCPP)						
				GEO-5406	Dissertation / Research Project	04
Total Credits of Semester - IV						24

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

- 1. 6 credits from Group - 1 are compulsory**
- 2. Choose minimum 6 credits from Group - 2 to Group - 7**

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

Note : 1) One Credit = 15 Lectures.

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

Semester.

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

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

Component (1 lecture per week) of self-study should be further evaluated through Group Discussion / Seminar / Open Book Test / MCQ / Essay writing / Assignment etc.

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Tuljaram Chaturchand College of Arts, Science and Commerce, Baramati

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Department of Geography**M.A/M.Sc. Geography Syllabus structure****2019 Pattern**

SEM	Course Code	Course title	Course Type	No. of Credits
I	GEO 4101	Principles of Geomorphology	Theory	04
	GEO 4102	Principles of Climatology	Theory	04
	GEO 4103	Principles of Economic Geography	Theory	04
	GEO 4104	Principles of Population and Settlement Geography	Theory	04
	GEO 4105	Practical in Physical Geography	Practical	04
	GEO 4106	Practical in Human Geography	Practical	04
II	GEO 4201	Coastal Geomorphology	Theory	04
	GEO 4202	Fluvial Geomorphology	Theory	04
	GEO 4203	Population Geography	Theory	04
	GEO 4204	Geography of Rural Settlements	Theory	04
	GEO 4211	Geoinformatics - I	Theory	04
	GEO 4212	Geography of Disaster Management	Theory	04
III	GEO 4213	Practical in Surveying	Practical	04
	GEO4214	Practical of Statistical Techniques for Geography	Practical	04
	GEO 5301	Tropical Geomorphology	Theory	04
	GEO 5302	Practical in Geomorphology	Practical	04
	GEO 5303	Urban Geography	Theory	04
	GEO 5304	Practical in Population and Settlement Geography	Practical	04
IV	GEO 5305	Geoinformatics-II	Theory	04
	GEO 5306	Geographical Thoughts	Theory	04
	GEO 5307	Practical in Geoinformatics	Practical	04
	GEO 5308	Watershed Management	Theory	04
IV	GEO 5401	Geography of India	Theory	04
	GEO 5402	Oceanography	Theory	04

GEO 5403	Research Methodology	Theory	04
GEO 5404	Geography of Soil	Theory	04
GEO 5405	Interpretation of Topographical Maps	Practical	04
GEO 5406	Research Project	Project	04

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

Subject: Geography of India**No. of Credits: 04****No. of Periods: 64****Course Objectives:**

1. To make students well aware of the location, extent, 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 the drainage basin of India, major rivers and their tributaries and area drained by them.
5. To understand the mechanism of monsoon, active and break periods of monsoon.
6. To understand the distribution of soil and forest cover in India.
7. To understand the types of minerals and energy resources in India.

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

- CO1. Aware of the location, extent, and neighboring countries of India and relationship with them.
- CO2. Understand the geological structure and physiographic divisions of India and its importance.
- CO3. Understand the different seasons, climate of India, and its impact on Indian agriculture.
- CO4. Understand the drainage basin of India, major rivers and their tributaries and area drained by them.
- CO5. Understand the mechanism of monsoon, active and break periods of monsoon, and trend of monsoon in past years.
- CO6. Aware about the 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 and industrialization in India.

Topics and Learning Points**Unit – 1: Introduction of India****06**

- 1.1. Geographical and relative location of India

- 1.2. Frontiers of India
- 1.3. Strategic Significance
- 1.4. Geological Structure

Unit – 2: Introduction of India**06**

(Main physiographic divisions & their importance)

- 2.1 The northern mountains
- 2.2 The north Indian Plain
- 2.3 The peninsular plateau
- 2.4 The coastal lowlands
- 2.5 The islands Structure

Unit – 3: Drainage System**06****3.1 Himalayan drainage systems**

1. Ganga
2. Brahmaputra
3. Indus

3.2 Peninsular drainage system**A) East Flowing Rivers:**

- 1) Godavari
- 2) Krishna
- 3) Mahanadi

B) West Flowing Rivers

- 1) Narmada
- 2) Tapi
- 3) Mahi

Unit – 4: Climate**06****4.1 Main Seasons & Associated weather conditions:**

- 1) The winter
- 2) The summer
- 3) The rainy/monsoon
- 4) The retreat monsoon

4.2 Origin and mechanism of monsoon:**A) Traditional concept:**

Halley's view

B) Recent Concept:

- 1) Role of Tibet plateau
- 2) ITCZ
- 3) Jet Stream
- 4) El-Nino

Unit – 5: Soil

06

5.1 Major soil types and their distribution in India

- 1) Alluvial soil
- 2) Black soil
- 3) Red soil
- 4) Laterite and Lateritic soils
- 5) Forest and Mountain soils
- 6) Arid and Desert soils
- 7) Saline and Alkaline soils
- 8) Peaty and Marshy soils

5.2 Soil degradation and soil conservation

Unit – 6: Forest

06

6.1 Main forest types and their distribution in India:

- 1) Moist Tropical forests
- 2) Dry Tropical forests
- 3) Montane Sub-tropical forests
- 4) Montane Temperate forests
- 5) Alpine forests

6.2 Deforestation and conservation of forest

Unit – 7: Minerals and Energy Resources

06

7.1 Distribution and Utilization of Minerals:

- 1) Iron Ore
- 2) Manganese
- 3) Bauxite

7.2 Distribution and Utilization of Energy Resources:

1. Coal

2. Petroleum
3. Natural gas

7.3 Major power projects in India:

1. Hydro electric
2. Thermal Power
3. Atomic power

Unit – 8: Agriculture

06

8.1 Distribution and Production of Major Crops:

- 1) Rice
- 2) Wheat
- 3) Cotton
- 4) Sugarcane

8.2 Green revolution in India:

1. Components of the Green Revolution
2. Merits and demerits of Green Revolution in India

8.3 Factors affecting Indian Agriculture:

1. Environmental Factors
2. Technological Factors
3. Institutional Factors

Unit – 9: Industries

06

9.1 Major Industries in India:

1. Cotton Textile
2. Sugar
3. Iron and Steel

9.2 Major Industrial Regions in India

9.3 Problems of Industrial development

Unit – 10: Population

06

10.1 Growth and distribution of population in India

10.2 Composition and structure of Population:

1. Rural-Urban
2. Age-sex
3. Religious

4. Marital status
5. Occupational structure

Reference Books:

1. Agrawal A. N. (2019): "Indian economy, Developmental Problems and policies" NewAge International Pvt. Ltd.
2. Bhende, Asha A and Kanitkar Tara (2015): "Principles of Population Studies", HimalayaPub. 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 SocialScience 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
10. Mathur, S. M. (1994): Physical Geology of India, National Book Trust, New Delhi, India.
11. Memoria, I. B. - Geography of India.
12. Singh R. L. (1971): "India-A Regional Geography". NGSI, Varanasi.
13. Randhawa, M. S. (1947): The Birth of the Himalayas.
14. Saigal, Umesh (1994): Lakshadweep, National Book Trust, New Delhi, India.
15. Sharma and Continuo - Economic and Commercial Geography of India.
16. Singh, R. L. et. al. (1971): India: A Regional Geography, National Geographical Societyof India, Varanasi.
17. Tamta, B. R. (1994): Andaman and Nicobar Islands, National Book Trust, New Delhi,India.

18. Wadia D. N. (1993): Geology of India, Tata McGraw Hill, New Delhi
19. Census of India Report – website- <http://censusindia.gov.in/>

Choice Based Credit System Syllabus

Mapping of Program Outcomes with Course Outcomes

Class: M.A/M.Sc. II

Subject: Geography

Course: Geography of India

Course Code: GEO: 5401

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

No. of Credits: 04**No. of 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 that create boulders and coral.
4. To understand the importance of the coastal zone with a future resources approach.
5. To know the geological, physical, chemical, and biological features and processes that affect the surface of the ocean.
6. To differentiate between underwater formations, seawater formations, seawater 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.** Identify physical features of the sea floor, such as its topography, sediment type, and distribution of available resources.**CO5.** Describe the properties of water, emphasizing how these properties change in the presence of salt.**CO6.** Evaluate threats to the marine or coastal environment.**CO7.** Develop an appreciation for the diversity and importance of life in the ocean.**Topics and Learning Points****Unit- 1: Introduction to Oceanography****No. of Periods**

- 1.1. Definition and Meaning of Oceanography
- 1.2. Foundation of Modern Oceanography
- 1.3. Contribution of Oceanographers in the subject
- 1.4. Post-war Oceanography
- 1.5. Modern Trends

08

Unit- 2: Origin of the Ocean Basins

- 2.1 Continental Drift
- 2.2 Seafloor Spreading
- 2.3 Plate Tectonics
- 2.4 World Oceans, their origin and distribution

3 Unit- 3: The Ocean Floor

08

Relief of the Ocean Bottom

- 3.1 Continental Margin: Continental shelves and slopes
- 3.2 Oceanic Ridges and Rises
- 3.3 Abyssal Plains
- 3.4 Oceanic Trenches
- 3.5 Volcanoes on ocean floor
- 3.6 Coral Reefs and Atolls
- 3.7 Offshore Islands

Unit- 4: Properties of Sea Water

12

- 4.1 Factors affect temperature on water and distribution
- 4.2 Factors affecting density
- 4.3 Origin and composition of sea salt and residence time
- 4.4 Carbon dioxide and carbonate cycles
- 4.5 Viscosity
- 4.6 Surface tension

Unit- 5: Marine Sediments

08

- 5.1 Lithogenous particles (Derived from Rocks)
- 5.2 Biogenous particles (derived from organisms)
- 5.3 Hydrogenous particles (derived from Water)
- 5.4 Distribution of sediment deposits
- 5.5 Oceanic ooze
- 5.6 Correlation and age determination

Unit- 6: Ocean resources

08

- 6.1 Natural resources- gaseous, liquefied and solid chemical parameters
- 6.2 Available resources
- 6.3 Exploited resources

6.4 Unexploited resources

6.5 Account of known but unexploited oceanic reserves

Unit- 7: Oceanic Pollution

08

Causes and measures

7.1 Etiology of marine & oceanic pollution

7.2 Possible natural disturbances causing pollution in oceans

7.3 Anthropogenic activities resulting in oceanic pollution

7.4 Oceanic pollutants and their characteristics for human benefits

7.5 Known remedial measures for pollution at sea & oceanic level

Reference Books:

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

Mapping of Program Outcomes with Course Outcomes

Class: M.A/M.Sc. II

Subject: Geography

Course: Oceanography

Course Code: GEO5402

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 anessential 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.

Course: GEO: 5403, Research Methodology**No. of Credits: 04****Periods: 64****Course Objectives:**

1. Understand the purpose and significance of research in various fields.
2. Understand the goals and objectives achieved through the formulation of a research design.
3. Learn techniques for identifying and formulating a clear research problem.
4. Understand the principles of sampling design.
5. Understand the concept of a questionnaire and its application in data collection.
6. Familiarize students with fundamental concepts and principles of research.
7. Develop skills in analyzing and interpreting research data to draw meaningful conclusions.

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

- CO1.** Gain an understanding of why research is conducted across different disciplines.
- CO2.** Understand the purpose of a research design in guiding the research process.
- CO3.** Acquire skills in identifying and defining research problems.
- CO4.** Understand the principles and techniques involved in selecting samples for a study.
- CO5.** Grasp the concept of a questionnaire and its role in collecting data.
- CO6.** Develop critical thinking skills necessary for evaluating research methodologies and findings.
- CO7.** Analyze and interpret research data to draw valid conclusions and make informed recommendations.

Topics and Learning**g****Unit- 1: Introduction to Research Methodology****No. of Periods**

- 1.1. Meaning and objectives of research
- 1.2. Characteristics of Research
- 1.3. Types of Research
- 1.4. Various steps in Research Process
- 1.5. Research Methods versus Methodology

10

Unit- 2: Research Design	08
2.1 Research Design definition	
2.2 Purpose of a Research Design	
2.3 Characteristics of Good Research Design	
Unit- 3: Research Problem	06
3.1 Definitions of the Research Problem	
3.2 Identification of a Research Problem	
3.3 Technique involved in defining a problem	
Unit- 4: Sampling Design	08
Sampling Design – Definition of Population,	
4.1 Sample and Sampling Design	
4.2 Advantages and disadvantages of Sampling	
4.3 Characteristics of a good sample	
4.4 Types or method of sampling	
Unit- 5: Data Analysis	12
5.1 Variables and their types	
5.2 Hypothesis- definition and types	
5.3 Measure for Central Tendency and Dispersion	
5.4 Correlation and Regression Analysis	
5.5 Time series analysis	
Unit- 6: Technical writing and reporting of research	06
6.1 Types of research report	
6.2 Dissertation and thesis, research paper, review article, short communication, conference presentation, meeting report, etc.	
6.3 Structure and organization of research reports- Title, abstract, key words, introduction, methodology, results, discussion, conclusion, acknowledgements, references, footnotes, tables and illustration	
6.4 Literature Review	
Unit- 7: Research ethics, plagiarism and funding agencies	06
7.1 Research ethics	
7.2 Plagiarism	
7.3 Use of plagiarism detection software's	
7.4 Research opportunities and funding agencies	

Reference Books:

1. Gaum, Carl G., Graves, Harold F., & Hoffman, Lyne S.S. (1950). *Report Writing* (3rd ed.). New York: Prentice-Hall.
2. Kothari, C.R. (2004). *Research Methodology: Methods and Techniques*. New Age International (P) Ltd., New Delhi.
3. Kothari, C.R. (1984). *Quantitative Techniques* (2nd ed.). New Delhi: Vikas Publishing House Pvt. Ltd.
4. Mishra, Shanti Bhushan & Shashi, A. (2011). *Handbook of Research Methodology*. Education Publishing, New Delhi.
5. Pandey, P., & Pandey, M.M. (2015). *Research Methodology: Tools and Techniques*. Bridge Center, Romania, European Union.
6. Tandon, B.C. (1979). *Research Methodology in Social Sciences*. Allahabad: Chaitanya Publishing House.
7. Ullman, Neil R. (1978). *Elementary Statistics*. New York: John Wiley & Sons, Inc.
8. Yamane, T. (1973). *Statistics: An Introductory Analysis* (3rd ed.). New York: Harper and Row.

Mapping of Program Outcomes with Course Outcomes

Class: M.A/M.Sc. II

Subject: Geography

Course: Research Methodology

Course Code: GEO: 5403

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

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	2	.	.	2	.	.	.	.
CO2	.	.	2	.	.	.	.	.
CO3	2	.	.	2	.	.	.	.
CO4	.	.	2	.	.	.	.	.
CO5	.	.	2	.	.	.	.	.
CO6	.	.	.	2	.	.	.	.
CO7	2	.	.	2	.	.	.	.

Justification for the Mapping

PO1: Research-Related Skills and Scientific Temper

CO1, CO3, CO7: Understanding the purpose of research and the motivations behind it is crucial for developing research skills. Skills in problem identification and formulating research designs equip students for effective research practices across disciplines. Additionally, CO7 emphasizes the importance of analyzing and interpreting research data, which is essential for rigorous research.

PO2: Effective Citizenship and Ethics

CO2: Recognizing the ethical considerations inherent in research design fosters responsible research practices. This awareness is critical for students aiming to contribute positively to society through their research efforts.

PO4: Disciplinary Knowledge

CO1, CO2, CO3, CO4, CO5, CO6, CO7: Each of these course outcomes contributes to students' disciplinary knowledge by providing a foundation in research methodology. The emphasis on different aspects of research, from problem identification to data collection techniques, allows students to understand the interdisciplinary nature of research and the specific requirements of various fields.

PO5: Critical Thinking and Problem Solving CO4, CO5, CO7: Understanding the principles of sampling design, the application of questionnaires, and analyzing research data fosters critical thinking and problem-solving skills. Students learn to evaluate methodologies and make informed decisions regarding research design, as well as draw meaningful conclusions from their findings.

PO6: Environment and Sustainability

CO6: Developing a deep understanding of the variety and significance of research not only contributes to scientific knowledge but also has implications for environmental sustainability. Students learn to appreciate the importance of research in addressing environmental challenges.

Course: GEO: 5404 Soil Geography**No. of Credits: 04****Periods: 64****Course Objectives:**

1. To understand soil as a key component of the Earth's biosphere and climate system.
2. To gain information about soil genesis and provide insights into the soil resources of an area.
3. To foresee the global consequences of direct and indirect human activities on soil conditions.
4. To visualize soil as a system of interacting components with interrelated physical, chemical, and biological properties.
5. To study the factors influencing soil formation and the geographic distribution of various soil types.
6. To recognize the significance of soil as a resource for agriculture and ecology.
7. To explore sustainable practices for soil management and conservation.

Course Objectives:

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

- CO1.** Explain the concepts and principles of soil formation and its importance in ecosystems.
- CO2.** Identify essential nutrients for plant growth and their role in soil health.
- CO3.** Analyze the impact of human activities on soil transformation, erosion, and degradation.
- CO4.** Assess soil and environmental problems, including contamination and nutrient depletion.
- CO5.** Describe the significance of soil conservation and various methods for soil reclamation.
- CO6.** Characterize different soil types, including their profiles and physical and chemical properties.
- CO7.** Propose sustainable soil management practices to enhance soil health and productivity.

Topics and Learning**Points****Unit- 1: Introduction to Geography of Soil****No. of Periods**

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

04

Unit- 2: Soil Formation and Soil Profile **06**

- 2.1 Factors of Soil formation: Parent Material, Climate, Biota, Time, Topography.
- 2.2 Soil Profile : Definition and Structure

Unit- 3: Components and Characteristics of Soil **06**

- 3.1 Soil component: Minerals, Organic Matter, Air and Water.
- 3.2 Physical, Chemical and Biological characteristics of soil.
- 3.3 Nutrients in Soils: Primary, Secondary and Micronutrients

Unit- 4: Classification and types of Soil **06**

- 4.1 Land Capability Classification
- 4.2 Land Suitability Classification
- 4.3 Types of Soil with reference to India

Unit- 5: Problems related to soil and Soil Conservation **08**

- 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 Books:

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
4. Birkeland, P. W (1999): Soils and Geomorphology, Oxford University Press, New York.
5. C. E. Miller, L.M. Turk, (2001): "Fundamental of soil Science" Biotech Books Delhi.
6. Daji, J. A. (1970): A Textbook of Soil Science, Asia Publication House, New York.
7. Lal, R. (ed.), (2002): Encyclopedia of soil science. Marcel Dekker, New York.
8. Miller, R. W. and Donahue, R. L. (1992): Soils: An Introduction to Soils and Plant

Growth, Prentice-Hall of India, New Delhi.

9. Pitty, A. F. (1978): Geography and Soil Properties, Methuen and Co., London.

10. S. C. Panda, (2007): "Soil water conservation and dry farming" Published by Agrobios

Mapping of Program Outcomes with Course Outcomes

Class: M.A/M.Sc. II

Subject: Geography

Course: Soil Geography

Course Code: GEO: 5404

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

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
CO1	3	2						
CO2			3		2		2	
CO3	2		2					2
CO4			2	2		1		
CO5				3	2		1	1
CO6	2					3		
CO7		3				2		

Justification for the Mapping

PO1: Research-Related Skills and Scientific Temper

CO1, CO3, CO6: Understanding soil formation and its complexities fosters research-related skills. Analyzing human impacts on soil and characterizing different soil types develops scientific thinking, crucial for conducting meaningful research in environmental science and geography.

PO2: Effective Citizenship and Ethics

CO2, CO7: Recognizing the role of essential nutrients in soil health and promoting sustainable practices empowers students to advocate for responsible land use. This ethical approach aligns with effective citizenship by encouraging stewardship of natural resources.

PO3: Social Competence

CO3, CO4: Analyzing the impact of human activities on soil degradation and understanding soil and environmental problems enhances students' social competence. This knowledge prepares them to engage in discussions about environmental sustainability and public policy.

PO4: Disciplinary Knowledge

CO1, CO4, CO5: Mastery of soil science concepts and methodologies develops disciplinary knowledge. Understanding soil conservation and reclamation methods equips students with the necessary tools to address practical challenges in agriculture and land management.

PO5: Environment and Sustainability

CO5, CO7: The emphasis on soil conservation and sustainable practices highlights the importance of environmental stewardship. Recognizing soil as a vital resource aligns with sustainable development goals, promoting responsible management of soil resources.

PO6: Critical Thinking and Problem Solving

CO6: Characterizing soil types and understanding their properties require critical thinking. Students learn to assess soil health and propose solutions for soil-related challenges, honing their problem-solving skills in real-world contexts.

PO7: Communication and Collaboration

CO2, CO5: Understanding the significance of soil nutrients and conservation methods encourages students to communicate effectively with peers and communities. Collaborative projects on sustainable soil management foster teamwork and collective action.

PO8: Critical Thinking and Problem Solving

CO3, CO4: Recognizing the global consequences of soil degradation and environmental problems cultivates critical thinking skills. Students analyze complex challenges, evaluate data, and formulate strategies to address issues affecting soil health and sustainability.

Course: GEO 5405 Interpretation of Topographical and Weather Maps**No. of Credit:** 04**Periods:** 64**Course Objectives:**

1. To understand the basics of SOI topographical maps and their components.
2. To interpret relief features on topographical maps effectively.
3. To introduce weather maps and their significance in geographical studies.
4. To achieve proficiency in GPS survey techniques, including reading maps and area measurement.
5. To gain practical experience through a one-day field visit and develop the ability to report on the excursion.
6. To recognize the signs and symbols used in weather maps.
7. To interpret weather maps for different seasons and understand their implications.

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

CO1. Understand the fundamentals of SOI topographical maps and their applications in geography.

CO2. Interpret relief features on topographical maps accurately.

CO3. Explain the significance of weather maps and their role in understanding climatic conditions.

CO4. Demonstrate proficiency in GPS survey techniques, including effective map reading and area measurement.

CO5. Reflect on practical experiences gained from a one-day field visit and report findings comprehensively.

CO6. Identify and describe the signs and symbols used in weather maps.

CO7. Analyze and interpret weather maps for various seasons, recognizing their impact on local and regional climates.

Topics and Learning**g****Unit – 1: Study of S.O.I Topographical Maps****No. of Periods**

Introduction to SOI topographical maps

08

Indexing systems and conventional signs and symbols

Grid references: 4-figure grid, 6-figure grid and International grid reference

Unit – 2: Interpretation of S.O.I toposheets**20**

2.1 Relief:

- 1) Distribution of Spot heights
- 2) Bench marks,
- 3) Trigonometrical Points
- 4) Types of Slopes
- 5) Major landforms from contour patterns

2.2 Drainage network:

- 6) Types-trellis, dendritic, radial, etc.
- 7) Streams with water
- 8) Streams without water
- 9) Influence of relief on drainage

2.3 Natural Vegetation

- 10) Types of vegetation,
- 11) Association of relief and drainage,
- 12) Reserved Forest
- 13) Protected Forest

2.4 Land Use

- 14) Agriculture
- 15) Mining
- 16) Areal distribution and impact of physical landscape.

2.5 Settlements:

- 2) Amenities, etc,
- 3) Distribution,
- 4) Relative size,
- 5) Relative distance (dispersed, nucleated etc)

2.6 Transport and Communication:

1. Types of roads,
2. Railway lines,
3. Facilities of communication

Unit – 3: Interpretation of Weather maps**20**

3.1 Introduction to Weather maps

3.2 Sign and symbol used in weather map.

3.3 Isobaric Patterns

- 1) Cyclones
- 2) Anticyclones
- 3) V Shaped cyclones
- 4) V shaped anticyclones
- 5) Col

3.4 Interpretation of weather maps

- 1) Summer season
- 2) Winter season
- 3) Rainy season

Unit – 4: GPS Survey of Village

06

4.1 Introduction of GPS

- 1) Space segment
- 2) Control segment
- 3) user segment

4.2 GPS Survey

- 1) GPS Reading and Area Measurement

4.3 One day field visit and excursion report

Reference Book:

1. Archer J. E and Dalton T. H. (1968), Field work in Geography B.T. Batsford Limite
2. Dury G.H. (1960): Map Interpretation. Sir Isaac Pitman and Sons Limited, Pitman House,Bath.
3. Gupta, K. K. and Tyagi, V. C. (1992): Working with maps, Survey of India Publication,Dehradun.
4. Jones P. A. (1968): Field work in Geography. Longmans, Green and Company Limited.
5. Meux A. H. (1960): Reading Topographical Maps. University of London Press Limited.
6. Petrie N. (1992): Analysis and Interpretation of Topographical Maps. Orient LongmanLimited Calcutta.
7. Ramamurthy, K. (1982): Map interpretation, Madras.
8. Tamaskar B.G. and Deshmukh V.M. (1974): Geographical Interpretation of IndianTopographical Maps. Orient Longman Limited, Bombay.
9. Vaidyanadhan. R. (1968): Index to a set of 60 topographical maps, CSIR, New Delhi.

Mapping of Program Outcomes with Course Outcomes

Class: M.A/M.Sc.

Subject: Geography

Course: Interpretation of Topographical and Weather Maps

Course Code: GEO: 5405

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				2				
CO 2	2			2				
CO 3				2				
CO 4				2				
CO 5	2			2				
CO 6	2			2				

Justification for the mapping

PO1: Research-Related Skills and Scientific temper CO2, Co5 and CO6 contribute to the development of student's research-related skills and scientific temper. the justification for these competencies lies in their collective contribution to individual and collective growth in the scientific and research domains. These skills and temperaments not only enhance the capabilities of individuals but also play a pivotal role in advancing knowledge, solving real-world problems, and contributing to societal progress.

PO4: Disciplinary Knowledge

Co1, Co2, Co3, Co4, Co5 and CO6, contribute to the development of students' trans-disciplinary knowledge. The collective justification for these competencies lies in their alignment with the foundational principles of geography, environmental science, and meteorology. These skills are crucial for professionals working in diverse roles, including spatial analysis, environmental management, weather forecasting, and surveying.