

Ahmednagar Jilha Maratha Vidya Prasarak Samaj's

New Arts, Commerce and Science College, Ahmednagar

(Autonomous)

(Affiliated to Savitribai Phule Pune University, Pune)



Choice Based Credit System (CBCS)

Master of Arts/Science (M. A./M.Sc.)

Geography

Syllabus of

MA/MSc. I Geography

Implemented from

Academic Year 2021 -22

Ahmednagar Jilha Maratha Vidya Prasarak Samaj's
New Arts, Commerce and Science College, Ahmednagar
(Autonomous)

Board of studies in Geography

Sr. No.	Name	Designation
1.	Dr. Anand P. Pandit	Chairman
2.	Prof. Bhagwan N. Kumbhar	Member
3.	Prof. Yogesh G. Kadam	Member
4.	Professor Dr. Sachin J. Deore	Academic Council Nominee
5.	Dr. Pandurang P. Chaudhari	Academic Council Nominee
6.	Prof. Sandip N. Deshmukh	Vice-Chancellor Nominee
7.	Dr. Asaram S. Jadhav	Alumni
8.	Mr. Vinit T. Bitla	Industry Expert
9.	Dr. Madhukar S. Kasture	Member (co-opt)
10.	Dr. Satish D. Kulkarni	Member (co-opt)
11.	Dr. Digambar D. Ahire	Member (co-opt)

1. Prologue/ Introduction of the programme:

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. Students will able use recent advanced techniques like GIS, RS, GPS, GNSS, Total station and Drone for surveying, mapping and geographical analysis.

2. Programme Outcomes (POs) (M.A./M.Sc. Geography):

1. Conduct Social Survey Project: Students 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.
2. Individual and teamwork: Students will able to works effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
3. Application of modern instruments: Students will be able to apply various modern instruments for data collection and field survey.
4. Application of GIS and modern Geographical Map Making Techniques: Students will learn to prepare map based on GIS by using the modern geographical map-making techniques.
5. 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.
6. Development of Communication Skill and Interaction Power: After the completion of the course, students will be efficient in their communication skill as well as power of social interaction.
7. Presentation Skill: Students are being able to understand and write effective reports and design credentials, make effective demonstrations, give and receive clear instructions.
8. 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.

3. Programme Structure and Course Titles

Sr. No.	Class	Semester	Course Code	Course Title	Credits
1.	MA/MSc. I	I	MSC-GEO 111 T	Principles of Geomorphology	04
2.	MA/MSc. I	I	MSC-GEO 112 T	Principles of Climatology	04
3.	MA/MSc. I	I	MSC-GEO 113 T	Principles of Population Geography	02
4.	MA/MSc. I	I	MSC-GEO 114 P	Practicals in Geomorphology	02
5.	MA/MSc. I	I	MSC-GEO 115 P	Practicals in Climatology	02
6.	MA/MSc. I	I	MSC-GEO 116 P	Practicals in Population Geography	02
7.	MA/MSc. I	I	MSC-GEO 117 T (A)	Principles of Settlement Geography	02
8.	MA/MSc. I	I	MSC-GEO 117 T (B)	Agricultural Geography	02
9.	MA/MSc. I	I	MSC-GEO 118 P (A)	Practicals in Settlement Geography	02
10.	MA/MSc. I	I	MSC-GEO 118 P (B)	Practicals in Agricultural Geography	02
11.	MA/MSc. I	I	MSC-GEO 119 T	Introduction to Geographic Information System	02
12.	MA/MSc. I	II	MSC-GEO 211 T	Principles of Economic Geography	04
13.	MA/MSc. I	II	MSC-GEO 212 T	Population Geography	04
14.	MA/MSc. I	II	MSC-GEO 213 T	Geography of Rural Settlement	02
15.	MA/MSc. I	II	MSC-GEO 214 P	Practicals in Economic Geography	02
16.	MA/MSc. I	II	MSC-GEO 215 P	Practicals in Surveying	02
17.	MA/MSc. I	II	MSC-GEO 216 P	Practicals in Map Projection	02
18.	MA/MSc. I	II	MSC-GEO 217 T (A)	Geoinformatics I	02
19.	MA/MSc. I	II	MSC-GEO 217 T (B)	Coastal Geomorphology	02
20.	MA/MSc. I	II	MSC-GEO 218 P (A)	Practicals in Geoinformatics I	02

21.	MA/MSc. I	II	MSC-GEO 218 P (B)	Practicals in Coastal Geomorphology	02
22.	MA/MSc. I	II	MSC-GEO 219 T	Introduction to Remote Sensing	02
23.	MA/MSc. II	III	MSC-GEO 311 T	Research Methodology	04
24.	MA/MSc. II	III	MSC-GEO 312 T	Geographical Thoughts	04
25.	MA/MSc. II	III	MSC-GEO 313 T	Physical Geography of India	02
26.	MA/MSc. II	III	MSC-GEO 314 P	Practicals in Statistical techniques in Geography I	02
27.	MA/MSc. II	III	MSC-GEO 315 P	Interpretation of Topographical Maps	02
28.	MA/MSc. II	III	MSC-GEO 316 P	Village Survey	02
29.	MA/MSc. II	III	MSC-GEO 317 T (A)	Geoinformatics II	02
30.	MA/MSc. II	III	MSC-GEO 317 T (B)	Fluvial Geomorphology	02
31.	MA/MSc. II	III	MSC-GEO 318 P (A)	Practicals in Geoinformatics II	02
32.	MA/MSc. II	III	MSC-GEO 318 P (B)	Practicals in Fluvial Geomorphology	02
33.	MA/MSc. II	III	MSC-GEO 319 T	Statistical Data Analysis using SPSS	02
34.	MA/MSc. II	IV	MSC-GEO 411 T	Political Geography	04
35.	MA/MSc. II	IV	MSC-GEO 412 T	Urban Geography	04
36.	MA/MSc. II	IV	MSC-GEO 413 T	Human Geography of India	02
37.	MA/MSc. II	IV	MSC-GEO 414 P	Practicals in Statistical techniques in Geography II	02
38.	MA/MSc. II	IV	MSC-GEO 415 P	Practicals in Cartography	02
39.	MA/MSc. II	IV	MSC-GEO 416 P	Practicals in Remote sensing and GIS	02
40.	MA/MSc. II	IV	MSC-GEO 417 T (A)	Watershed Management	02
41.	MA/MSc. II	IV	MSC-GEO 417 T (B)	Tropical Geomorphology	02
42.	MA/MSc. II	IV	MSC-GEO 418 P (A)	Practicals in Watershed Analysis	02
43.	MA/MSc. II	IV	MSC-GEO 418 P (B)	Practicals in Terrain Analysis	02

44.	MA/MSc. II	IV	MSC-GEO 419 PR	Project work	02
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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -I	Paper -I
Course Code: MSC-GEO 111 T	Title of the Course: Principles of Geomorphology
Credits: 04	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will understand basic concepts, history and branches of geomorphology.
2. Students will understand various theories and processes of landforms development.
3. Students will be able to explain different types of geomorphic processes like weathering, erosion and mass movement.
4. Student will acquire knowledge about folds, faults and associated landforms.
5. Students understand the processes of erosion, transportation and deposition and resulting landforms.

Detailed Syllabus:

Unit I: Introduction to Geomorphology (08)

- i. Definitions, Nature and Scope of Geomorphology
- ii. History of Geomorphology
- iii. Geologic time scale

Unit II: Geomorphology and Tectonics (12)

- i. Internal structure of the Earth: Layers based on physical and chemical properties
- ii. Seismic waves and types
- iii. Wegener's Continental Drift Theory
- iv. Theory of Plate Tectonics
- v. Isostasy
- vi. Folds: Types and landforms

- vii. Faults: Types and landforms
- Unit III: Weathering and Mass Movement Processes (06)**
 - i. Weathering: Types
 - ii. Mass Movement: Types of mass movement
- Unit IV: Hillslopes (05)**
 - i. Hillslope processes and forms
 - ii. Models of hillslope evolution
- Unit V: Fluvial Processes and Landforms (08)**
 - i. Drainage basin and drainage network patterns
 - ii. River processes: Erosion, Transportation and Deposition
 - iii. Fluvial landforms: Erosional and Depositional
- Unit VI: Glacial Processes and Landforms (07)**
 - i. Types of glaciers
 - ii. Glacial processes: erosion, transportation and deposition
 - iii. Glacial landforms: erosional and depositional
- Unit VII: Coastal Processes and Landforms (07)**
 - i. Coastal processes: Erosion, Transportation and Deposition
 - ii. Coastal landforms: erosional and depositional
- Unit VIII: Arid Processes and Landforms (07)**
 - i. Wind processes: erosion, transportation and deposition
 - ii. Arid landforms: erosional and depositional

Suggested Readings:

1. Bloom, A.L. (2012): Geomorphology- A Systematic Analysis of Late Cenozoic Landforms, Prentice-Hall of India, New Delhi
2. Chorley, R.J., Schumm, S. A. and Sugden, D. E. (1984): Geomorphology, Methuen, London.
3. Gregory, K.J. and Goudie, A.S. (2014): The SAGE Handbook of Geomorphology, SAGE, London.

4. Christiansen E.H. and Hamblin, W.K. (2008): The Earth's dynamic systems Macmillan, New York and Collier Macmillan London.
5. Holmes, (1944): Principles of Physical Geology, Thomas Nelson and Sons Ltd, London.
6. Huggett, R.J. (2008): Fundamentals of Geomorphology, Routledge, London and New York.
7. Goudie A.S. (2004): Encyclopedia of Geomorphology, Routledge, London and New York.
8. Kale, V.S. (2014): Landscapes and Landforms of India, Springer, London/New York.
9. Kale, V.S. and Gupta, A. (2010): Introduction to Geomorphology, Universities Press, Hyderabad
10. Migon, P. (2010): Geomorphological Landscapes of the World, Springer, London/New York.
11. Ollier, C.D. (1981): Tectonics and Landforms, Longman, London.
12. Singh, S. (2011): Geomorphology, Prayag Pustak Bhawan, Allahabad.
13. Siddhartha, K. (2001): The Earth's dynamic surface, Kishore, Delhi.
14. Spark, B.W. (1972): Geomorphology, Longman, New York.
15. Steers, A. (1958): The Unstable Earth, Methuen, London.
16. Strahler, A.H. and Strahler, A.N. (1992): Modern Physical Geography, John Wiley, New York.
17. <https://www.pmfias.com/category/geography-upsc-ias/>
18. <https://studymaterial.unipune.ac.in/>

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Semester -I	Paper -II
Course Code: MSC-GEO 112 T	Title of the Course: Principles of Climatology
Credits: 04	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will understand concepts, development and branches of climatology.
2. Students will recognize evolution, structure, composition and importance of atmosphere.
3. Students will understand the insolation, mechanism of heat transfer, lapse rate and inversion of temperature.
4. Students will recognize atmospheric pressure, pressure belts and its relation with wind system.
5. Students will understand concepts of atmospheric moisture and atmospheric stability, air masses and air fronts.

Detailed Syllabus:

Unit I: Introduction (06)

- i. Meteorology and Climatology
- ii. Nature and Scope of Climatology
- iii. Development of Climatology
- iv. Tropical Climatology

Unit II: Earth's Atmosphere (06)

- i. Evolution of atmosphere
- ii. Structure and composition of atmosphere
- iii. Importance of ozone layer and the ozone layer depletion
- iv. Aurora –types

Unit III: Insolation (12)

- i. Electromagnetic spectrum
- ii. Concept and significance of insolation
- iii. Factors affecting insolation
- iv. Latitudinal and seasonal variation
- v. Solar and terrestrial radiation
- vi. Mechanisms of heat transfer
- vii. Heat budget
- viii. Greenhouse effect

Unit IV: Temperature (06)

- i. Concept of Heat and temperature
- ii. Lapse rate
- iii. Temperature inversion
- iv. Types of Temperature inversion

Unit V: Atmospheric Pressure and Winds (12)

- i. Pressure measurement and distribution
- ii. Factors affecting distribution of pressure
- iii. Wind observation and measurement
- iv. Factors affecting wind
- v. Geostrophic wind and Gradient wind
- vi. Local winds and their types
- vii. Jet stream
- viii. Cyclones and Anticyclones
- ix. Models of general circulation of the atmosphere

Unit VI: Atmospheric Moisture (06)

- i. Atmospheric moisture
- ii. Hydrologic cycle
- iii. Evaporation and condensation
- iv. Forms of condensation
- v. Precipitation
- vi. Types of precipitation

Unit VII: Atmospheric Stability**(06)**

- i. Lapse Rate: normal, environmental, dry adiabatic lapse rate and wet adiabatic lapse rate
- ii. Stable and unstable air
- iii. Absolute stability
- iv. Absolute instability
- v. Conditional instability

Unit VIII: Air Masses and Fronts**(06)**

- i. Introduction to air masses and fronts
- ii. Types of air masses
- iii. Types of fronts

Suggested Readings:

1. Critchfield, H.J. (Rep. 2010): General Climatology. Prentice Hall, New Delhi.
2. Lal, D.S. (1998): Climatology, Chaitanya Publishing House, Allahabad.
3. Lutgens, Frederic K. & Tarbuck, Edward J. (2010): 'The Atmosphere: An Introduction to Meteorology', Pearson Prentice Hall, New Jersey.
4. Oliver, John E. & Hidore, John J. (2003): Climatology: An Atmospheric Science, Pearson Education, Delhi
5. Savindra Singh (2005): Climatology, Prayag Pustak Bhawan, Allahabad.
6. Trewartha, G. T (1937): Introduction to Weather and Climate, McGraw-Hill, London.
7. Richard Rennebog (2018): Principles of Climatology, Salem Press, a division of EBSCO Information Service, Incorporated.
8. Salvador Poole (2019): Callisto Reference.
9. More, Pagar, Thorat (2014): Elements of Climatology & Oceanography, Atharv Publication, Pune.
10. <https://mausam.imd.gov.in/>
11. <https://www.pmfias.com/category/geography-upsc-ias/>
12. <https://www.ncdc.noaa.gov/cdo-web/>
13. <https://worldweather.wmo.int/en/home.html>
14. <https://climate.nasa.gov/vital-signs/global-temperature/>

15. <https://studymaterial.unipune.ac.in/>

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**Syllabus of M.A./M.Sc. I Geography
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Semester -I	Paper -III
Course Code: MSC-GEO 113 T	Title of the Course: Principles of Population Geography
Credits: 02	Total Lectures: 30 Hrs

Course Outcomes:

1. Students will understand basic concepts, principles and approaches of population geography.
2. Students will well aware about population distribution, density and its factors influencing.
3. Students will understand the concepts, components and theories of population growth and trend of population growth in India.
4. Students will acquaint the knowledge of structure and characteristic of population with special reference to India.
5. Students will understand the concept and basic measures of fertility and mortality.

Detailed Syllabus:

Unit I: Introduction to Population Geography (06)

- i. Definitions of Population Geography
- ii. Nature and scope of Population Geography
- iii. Origin and Development of Population Studies

Unit II: Population Distribution (06)

- i. Population distribution and its factors influencing
- ii. Population density: Definition and Types
- iii. Factors influencing on Population Density
- iv. Population density in India

Unit III: Population Growth and Trend (06)

- i. Concept of population growth
- ii. Component of population growth (Fertility, Mortality and Migration)
- iii. Theory of Demographic Transition
- iv. Malthus' Theory of Population
- v. Trend of population growth in India

Unit IV: Population Structure and Characteristics (06)

- i. Age Structure and Dependency Ratio
- ii. Concept of aging of population
- iv. Sex Ratio: definition and factors affecting on sex ratio
- iv. Age-Sex Pyramid
- v. Level and Trend of Sex ratio in India
- vi. Religious and Linguistics composition of India
- vii. Level and Trend of Literacy in India

Unit V: Fertility and Mortality (06)

- i. Concepts: fertility, fecundity, sterility, cohort
- ii. Crude Birth Rate, Age specific fertility rate and Total Fertility Rate
- iii. Concept of baby boom
- iv. Concepts: mortality and morbidity
- v. Crude Death Rate, Age-Specific Death Rate and Infant mortality rate

Suggested Readings:

1. Bhende, A. and Kanitkar, T. (2011): Principles of Population Studies, Himalaya Publishing House, Bombay.
2. Beaujeu, G. J. (1966): Geography of Population, Longman Group Ltd.
3. Chandna, R.C. (Rep.2010): Geography of Population, Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi.
4. Clark, J. I. (1973): Population Geography, Pergamon Press Ltd., Oxford.
5. Clark, J.I. (1984): Geography and Population: Approaches and Applications, Pergamon Press Ltd., Oxford.

6. Hudson, (1970): Geography of Settlement, Macdonald & Evans Ltd., London.
7. Khullar, D. R. (2011): India A Comprehensive Geography, Kalyani Publication, New Delhi.
8. Michel Chisholm (1973): Studies in Human Geography, London.
9. Mishra, R.S. (1975): Economics of Growth and Development, Somaiya Publication Pvt. Ltd.
10. Singh R.Y. (Rep. 2010): Geography of Settlements, Rawat Publication.
11. Musmade Arjun, Sonawane Amit and Jyotiram More, (2015): Population & Settlement Geography, Diamond Publication Pune.
12. <https://censusindia.gov.in/>
13. <https://mahades.maharashtra.gov.in/publications.do?pubId=DSA>
14. <https://ahmednagar.nic.in/document-category/dsa/>
15. <https://studymaterial.unipune.ac.in/>

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Semester -I	Paper – IV
Course Code: MSC-GEO 114 P	Title of the Course: Practicals in Geomorphology
Credits: 02	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will able to prepare drainage network map using methods of stream ordering.
2. Students will able to draw and use the various drainage basin analysis methods.
3. Students will able to identify geographical landforms through observation.

Detailed syllabus:

Unit I: Drainage Network (04)

Stream ordering and Bifurcation ratio

- i. Strahler's Method
- ii. Horton's Method

Unit II: Drainage Basin Relief Analysis (06)

Relief analysis (for 3 to 5 order drainage basin; based on grid method)

- i. Absolute relief map
- ii. Relative relief map
- iii. Hypsometric analysis
- iv. Basin cross profiles
- v. Block diagram (multiple section)

Unit III: Field Visit (02)

- i. Visit to geographical place and identification of landforms

Suggested Readings:

1. Asis Sarkar (2015): Practical Geography, A Systematic Approach, Orient Black Swan
2. Carter, H. (1977): The study of Urban Geography, Edward Arnold, London.
3. Hans, R. (1978): Fundamentals of Demography, Surjeet, Delhi.
4. Hudson F.S. (1976): Geography of Settlements, Estover, Macdonald & Evans, England.
5. Liendsor, J.M. (1997): Techniques in Human Geography, Routledge.
6. Lloyd, P. and Dicken, B. (1972): Location in Space - A theoretical approach to economic geography, Harper and Row, New York.
7. Michael, E. and Hurse, E. (1974): Transportation Geography, McGraw-Hill, New York.
8. Pollard, A.H. and Farhat Yusu. (1974): Demographic Techniques, Rushcutters Bay, N.S.W., Pergamon Press, Australia.
9. Singh, J. and Dhillon, (1984): Agricultural Geography, Tata McGraw-Hill Publishing Company Limited, New Delhi.
10. Yeats, M.H. (1974): An Introduction to Quantitative Analysis in Human Geography, McGraw-Hill, New York.
11. <https://studymaterial.unipune.ac.in/>

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**Syllabus of M.A./M.Sc. I Geography
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Semester -I	Paper – V
Course Code: MSC-GEO 115 P	Title of the Course: Practicals in Climatology
Credits: 02	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will able to measure weather elements using weather instruments
2. Students will able to represent climatic data using appropriate methods
3. Students will classify climate using Koppen's and Thornthwaite's methods
4. Students will able to collect weather data and represent it using appropriate techniques

Detailed syllabus:

Unit I: Weather Elements (02)

- i. Instruments and measurement techniques of weather elements

Unit II: Representation of Climatic Data (04)

- i. Climatograph
- ii. Climograph
- iii. Simple wind rose
- iv. Hythergraph

Unit III: Climatic Classification (04)

- i. Koppen's classification
- ii. Thornthwaite's Classification

Unit IV: Data Collection (02)

- i. Collection of weather data and representation using appropriate method

Suggested Readings:

1. Asis Sarkar (2015): Practical Geography, A Systematic Approach, Orient Black Swan
2. Carter, H. (1977): The study of Urban Geography, Edward Arnold, London.
3. Hans, R. (1978): Fundamentals of Demography, Surjeet, Delhi.
4. Hudson F.S. (1976): Geography of Settlements, Estover, Macdonald & Evans, England.
5. Liendsor, J.M. (1997): Techniques in Human Geography, Routledge.
6. Lloyd, P. and Dicken, B. (1972): Location in Space - A theoretical approach to economic geography, Harper and Row, New York.
7. Michael, E. and Hurse, E. (1974): Transportation Geography, McGraw-Hill, New York.
8. Pollard, A.H. and Farhat Yusu. (1974): Demographic Techniques, Rushcutters Bay, N.S.W., Pergamon Press, Australia.
9. Singh, J. and Dhillon, (1984): Agricultural Geography, Tata McGraw-Hill Publishing Company Limited, New Delhi.
10. Yeats, M.H. (1974): An Introduction to Quantitative Analysis in Human Geography, McGraw-Hill, New York.
11. <https://mausam.imd.gov.in/>
12. <https://www.pmfias.com/category/geography-upsc-ias/>
13. <https://www.ncdc.noaa.gov/cdo-web/>
14. <https://worldweather.wmo.int/en/home.html>
15. <https://climate.nasa.gov/vital-signs/global-temperature/>
16. <https://studymaterial.unipune.ac.in/>

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Semester -I	Paper -VI
Course Code: MSC-GEO 116 P	Title of the Course: Practicals in Population Geography
Credits: 02	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will able to calculate various population indices
2. Students will able to compute population growth and population projection
3. Students will able to collect and graphically represent the population data

Detailed syllabus:

Unit I: Population Indices (06)

- i. Age-Sex pyramid
- ii. Dependency Ratio
- iii. Child-Women Ratio
- iv. Infant Mortality Rate
- v. Mean Age at Marriage and Infant Mortality Relationship

Unit II: Demographic Transition and Population Projection (04)

- i. Population Growth Rate
- ii. Population Projection
- iii. Testing of Demographic transition Theory

Unit III: Population Data Collection (02)

- i. Preparation of Questionnaire for population data collection
- ii. Collection of Population Data and representation

Suggested Readings:

1. Asis Sarkar (2015): Practical Geography, A Systematic Approach, Orient Black Swan
2. Carter, H. (1977): The study of Urban Geography, Edward Arnold, London.
3. Hans, R. (1978): Fundamentals of Demography, Surjeet, Delhi.
4. Hudson F.S. (1976): Geography of Settlements, Eastover, Macdonald & Evans, England.
5. Liendsor, J.M. (1997): Techniques in Human Geography, Routledge.
6. Lloyd, P. and Dicken, B. (1972): Location in Space - A theoretical approach to economic geography, Harper and Row, New York.
7. Michael, E. and Hurse, E. (1974): Transportation Geography, McGraw-Hill, New York.
8. Pollard, A.H. and Farhat Yusu. (1974): Demographic Techniques, Rushcutters Bay, N.S.W., Pergamon Press, Australia.
9. Singh, J. and Dhillon, (1984): Agricultural Geography, Tata McGraw-Hill Publishing Company Limited, New Delhi.
10. Yeats, M.H. (1974): An Introduction to Quantitative Analysis in Human Geography, McGraw-Hill, New York.
11. <https://censusindia.gov.in/>
12. <https://mahades.maharashtra.gov.in/publications.do?pubId=DSA>
13. <https://ahmednagar.nic.in/document-category/dsa/>
14. <https://studymaterial.unipune.ac.in/>

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Semester -I	Paper – VII
Course Code: MSC-GEO 117 T (A)	Title of the Course: Principles of Settlement Geography
Credits: 02	Total Lectures: 30 Hrs

Course Outcomes:

1. Students will understand basic concepts of settlement geography
2. Students will understand the classification of settlements on various basis
3. Students will well aware about site, types and factors of rural settlements
4. Students will understand concepts and models related to urban settlements

Detailed syllabus:

Unit I: Introduction to Settlement Geography (06)

- i. Definition, Nature and Scope of Settlement Geography
- ii. Development of Settlement of Geography
- iii. Approaches: Genetic, Spatial and Ecological

Unit II: Classification of Settlements (08)

- i. Classification of Settlement: urban and rural
- ii. Site and situation aspect in settlement
- iii. Types: compact, semi-compact, helmeted and dispersed
- iv. Patterns of settlements

Unit III: Rural Settlements (08)

- i. Definition and classification of villages
- ii. Size and spacing of villages

- iii. Nearest neighbor analysis
- iv. Concepts of dispersion and nucleation
- v. Factors affecting dispersion and nucleation

Unit IV: Urban Settlements**(08)**

- i. Concept: urban place, urban agglomeration, urban sprawl
- ii. Stages of Urbanization
- iii. Urban-rural fringe: Concept and Characteristics
- iv. Rank-size rule
- v. Central Business District (CBD): Concept and Characteristics

Suggested Readings:

1. Bhende, A. and Kanitkar, T. (2011): Principles of Population Studies, Himalaya Publishing House, Bombay.
2. Beaujeu, G. J. (1966): Geography of Population, Longman Group Ltd.
3. Chandna, R.C. (Rep.2010): Geography of Population, Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi.
4. Clark, J. I. (1973): Population Geography, Pergamon Press Ltd., Oxford.
5. Clark, J.I. (1984): Geography and Population: Approaches and Applications, Pergamon Press Ltd., Oxford.
6. Hudson, (1970): Geography of Settlement, Macdonald & Evans Ltd., London.
7. Khullar, D. R. (2011): India A Comprehensive Geography, Kalyani Publication, New Delhi.
8. Michel Chisholm (1973): Studies in Human Geography, London.
9. Mishra, R.S. (1975): Economics of Growth and Development, Somaiya Publication Pvt. Ltd.
10. Singh R.Y. (Rep. 2010): Geography of Settlements, Rawat Publication.
11. Musmade Arjun, Sonawane Amit and Jyotiram More, (2015): Population & Settlement Geography, Diamond Publication Pune.
12. <http://studymaterial.unipune.ac.in/>

**Ahmednagar Jilha Maratha Vidya Prasarak Samaj's
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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -I	Paper – VIII
Course Code: MSC-GEO 117 T (B)	Title of the Course: Agricultural Geography
Credits: 02	Total Lectures: 30 Hrs

Course Outcomes:

1. Students will aware about recent trends in agriculture geography
2. Students will understand an importance of agriculture in the Indian economy
3. Students will recognize the determinants of agriculture
4. Students will understand the techniques of crop combination and agricultural efficiency
5. Students will know about the characteristics of Indian agriculture

Detailed Syllabus:

Unit I: Introduction to Agricultural Geography (03)

- i. Definition, nature, scope and significance
- ii. Recent trends in Agriculture Geography

Unit II: Significance of Agriculture (03)

- i. Significance of agriculture in world
- ii. Importance of agriculture in the Indian economy
- iii. Role of agro-based industry in regional development

Unit III: Determinants of Agriculture (04)

- i. Physical factors
- ii. Economic factors
- iii. Social factor
- iv. Technological factors

Unit IV: Agricultural regionalization (05)

- i. Definition and concept
- ii. Views of Baker and Whittlesey
- iii. Crop combination techniques: Weaver and Thomas method
- iv. Agricultural efficiency: Kendall's ranking coefficient, Bhatia's method

Unit V: Agricultural Types (10)

- i. Subsistence Agriculture: Definition and Characteristics
- ii. Types of substance agriculture
 - a. Shifting cultivation
 - b. Dry land farming
 - c. Intensive subsistence agriculture
- iii. Commercial farming: Definition and Characteristics
- iv. Types of commercial farming
 - a. Commercial grain farming
 - b. Mixed farming
 - c. Horticulture
 - d. Plantation agriculture

Unit VI: Problems and Prospects of Agriculture (05)

- i. Problems and prospects with reference to India
- iii. Role of irrigation in agriculture development
- iii. Green revolution in India: Characteristics and problems

Suggested Readings:

1. Aiyer, A.K.Y.N. (1949): Agricultural and Allied Arts in Vedic India.
2. Bayliss Smith, T.P. (1987): The Ecology of Agricultural Systems. Cambridge University Press, London.
3. Berry, B.J.L. et. al. (1976): The Geography of Economic Systems. Prentice Hall, New York.
4. Brown, L.R. (1990): The Changing World Food Prospects - The Nineties and Beyond. World Watch Institute, Washington D.C.

5. Dyson, T. (1996): Population and Food, Global Trends and Future Prospects. Routledge, London.
6. Gregor, H.P. (1970): Geography of Agriculture. Prentice Hall, New York.
7. Grigg, D.B. (1974): The Agricultural Systems of the World. Cambridge University Press, New York.
8. Grigg, D.G. (1974): The Agricultural Systems of the world An Evolutionary Approach.
9. Hartshorn, T.N. and Alexander, J.W. (1988): Economic Geography. Prentice Hall, New Delhi.
10. Illbery, B.W. (1985): Agricultural Geography, Social & Economic Analysis, Oxford University Press.
11. Mannion, A.M. (1995): Agriculture and Environment Change. John Wiley, London.
12. Morgan, W.B. (1987): Agriculture in the Third World - A Spatial Analysis. Westview Press, Boulder.
13. Morgan, W.B. and Monton, S.C. (1971): Agricultural Geography Methuen, London.
14. Patil S. G., Suryawanshi R. S., Pacharne S. and Choudhar A. H. (2014): Economic Geography, Atharav Prakashan, Pune.
15. Pagar S. D., More J. C. & Thorat A. M. (2015): Agricultural Geography, Atharva Publication, Pune.
16. Randhawa, M.S. (1980): An History of Agriculture in India Vols. I, II, III, IV, ICAR, New Delhi.
17. Saptarshi P.G., More J.C., Ugale V.R., Musmade A.H. (2009): India A Geographical Analysis, Diamond, Pune.
18. Sauer, C.O. (1969): Agricultural Origins and Dispersals. M.I.T. Press, Mass, U.S.A.
19. Singh, J. and Dhillon, S.S. (1988): Agricultural Geography, 2nd edition, Tata McGraw Hill, New Delhi.
20. Singh, J. and Dhillon, S.S. (1994): Agricultural Geography, Tata McGraw Hill, Publishing.
21. Symons, Leslie (1970): Agricultural Geography, G. Belt and Sons Ltd., London.
22. Tarrent, J.R. (1970): Agricultural Geography, David and Charles, Newton Abbot.
23. Wigley, G. (1981): Tropical Agriculture: The Development of Production, 4th edition, Arnold, London.
24. <http://studymaterial.unipune.ac.in/>

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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -I	Paper -IX
Course Code: MSC-GEO 118 P (A)	Title of the Course: Practicals in Settlement Geography
Credits: 02	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will able to calculate measures of nucleation and dispersion
2. Students will able to analyze hierarchy and interaction among settlements
3. Students will understand the developmental aspects of settlement

Detailed Syllabus:

Unit I: Measures of Nucleation and Dispersion (03)

- i. Nearest neighbour analysis
- ii. Calculation of centrality

Unit II: Hierarchy and Interaction of settlements (05)

- i. Gravity model by W.J.Reilly and Zipf
- ii. Rank Size Rule
- iii. Stages according urbanization curve
- iv. Gini's Index

Unit III: Developmental aspects of Settlements (04)

- i. Relation between Basic/Non-Basic Ratio and Development of settlement
- ii. Relationship between land value and land use

Suggested Readings:

1. Asis Sarkar (2015): Practical Geography, A Systematic Approach, Orient Black Swan
2. Carter, H. (1977): The study of Urban Geography, Edward Arnold, London.
3. Hans, R. (1978): Fundamentals of Demography, Surjeet, Delhi.
4. Hudson F.S. (1976): Geography of Settlements, Eastover, Macdonald & Evans, England.
5. Liendsor, J.M. (1997): Techniques in Human Geography, Routledge.
6. Lloyd, P. and Dicken, B. (1972): Location in Space - A theoretical approach to economic geography, Harper and Row, New York.
7. Michael, E. and Hurse, E. (1974): Transportation Geography, McGraw-Hill, New York.
8. Pollard, A.H. and Farhat Yusu. (1974): Demographic Techniques, Rushcutters Bay, N.S.W., Pergamon Press, Australia.
9. Singh, J. and Dhillon, (1984): Agricultural Geography, Tata McGraw-Hill Publishing Company Limited, New Delhi.
10. Yeats, M.H. (1974): An Introduction to Quantitative Analysis in Human Geography, McGraw-Hill, New York.
11. <http://studymaterial.unipune.ac.in/>

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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -I	Paper -X
Course Code: MSC-GEO 118 P (B)	Title of the Course: Practicals in Agricultural Geography
Credits: 02	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will able to calculate level and index of agricultural productivity
2. Students will able to calculate crop combination using various methods
3. Students will able to calculate agricultural efficiency

Detailed Syllabus:

Unit I: Crop Concentration and Diversification (05)

- i. Levels in agricultural productivity – crop yield and concentration indices ranking coefficient (Jasbir Singh)
- ii. Enyedi's productivity index of agriculture

Unit II: Crop Combination Methods (05)

- i. Weaver's method
- ii. Jasbir Singh

Unit III: Measurement of Agricultural Efficiency (02)

- i. Kendall's Method

Suggested Readings:

1. Asis Sarkar (2015): Practical Geography, A Systematic Approach, Orient Black Swan
2. Carter, H. (1977): The study of Urban Geography, Edward Arnold, London.

3. Hans, R. (1978): Fundamentals of Demography, Surjeet, Delhi.
4. Hudson F.S. (1976): Geography of Settlements, Eastover, Macdonald & Evans, England.
5. Liendsor, J.M. (1997): Techniques in Human Geography, Routledge.
6. Lloyd, P. and Dicken, B. (1972): Location in Space - A theoretical approach to economic geography, Harper and Row, New York.
7. Michael, E. and Hurse, E. (1974): Transportation Geography, McGraw-Hill, New York.
8. Pollard, A.H. and Farhat Yusu. (1974): Demographic Techniques, Rushcutters Bay, N.S.W., Pergamon Press, Australia.
9. <http://mospi.nic.in/agriculture-statistics>
10. <https://www.indiastat.com/data/agriculture>
11. <http://studymaterial.unipune.ac.in/>

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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -I	Paper – XI
Course Code: MSC-GEO 119 T	Title of the Course: Introduction to Geographic Information System (GIS)
Credits: 02	Total Lectures: 30 Hrs

Course Outcomes:

1. Students will understand basics of Geographical Information system.
2. Students will aware about data types and models in GIS.
3. Students will able to Geo-referencing of Toposheets and maps.
4. Students will able to digitize point, line and polygon.
5. Students will able to attach data and create a layout of map.

Detailed Syllabus:

Unit I. Introduction to GIS (06)

1. Definition of GIS
2. Stages of GIS Development
3. Objectives of GIS
4. Components GIS
5. GIS Applications

Unit II. Data Types & Models (06)

1. Spatial Data – Concept, Sources; Data Models – Raster & Vector
2. Non-spatial Data – Concept, Sources; Data Models – Relational, Network, Hierarchical & Object orientated

Unit III. Software based Practical (18)

1. Geo-referencing of Toposheet/Map

2. Digitization of Point, Line & Polygon (at least one layer of each)
3. Data Attachment
4. Creation of Layout and Map

Suggested Readings:

1. Burrough, P. A. and McDonnell, R. A. (2000): Principles of Geographical Information Systems, Oxford University Press, New York.
2. Chang, K. T. (2008): Introduction to Geographic Information Systems, Avenue of the Americas, McGraw-Hill, New York.
3. Debashis, C. and Sahoo, R. N. (2015): Fundamentals of Geographic Information System, Viva Books Private Limited.
4. DeMers, M. N. (2008): Fundamentals of Geographic Information Systems, John Wiley and Sons, New Delhi.
5. Heywood, I., Corneliuss, S. and Carver, S. (2011): An Introduction to Geographical Information Systems, Pearson Education, New Delhi.
6. Karlekar, S. (2007): Bhaugolik Mahiti Pranali (GIS), Diamond Publications, Pune.
7. Korte, G. B. (2001): The GIS Book, Onward Press, Bangalore.
8. Longley, P. A., Goodchild, M. F., Maguire, D. J. and Rhind, D. W. (2002): Geographical Information Systems and Science, John Wiley & Sons, Chichester.
9. Lo Albert, C. P., Yeung and Albert K. W. (2002): Concepts and Techniques of Geographical Information Systems, Prentice Hall of India, New Delhi.
10. Pandey, J. and Pathak D. (2015): Geographic Information System, TERI Press, The Energy and Resources Institute, New Delhi.
11. Paul, A. L., Michel, F. G., Maguire, D. J. and Rhind, D.W. (2002): Introduction to Geographic Information Systems and Science, John Wiley and Sons Ltd.
12. <http://studymaterial.unipune.ac.in/>
13. www.iirs.gov.in

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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -II	Paper – I
Course Code: MSC-GEO 211 T	Title of the course: Principles of Economic Geography
Credits: 04	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will understand basic concepts and recent trend in economic geography
2. Students will know economic activities, their factors and models of location
3. Students will recognize types and importance of resources
4. Students will gain knowledge of concept, measures and models of economic development
5. Students will understand fundamental concepts related to transportation, communication urbanization, privatization and economic development.

Detailed Syllabus:

Unit I: Introduction to Economic Geography (06)

- i. Definition, nature and scope
- ii. Approaches: traditional and modern
- iii. Recent trends in Economic Geography

Unit II: Economic Activities (12)

- i. Definition and classification of economic activities
- ii. Factors of location of economic activities: physical, social, economic and technical
- iii. Location of economic activities: Weber's and Von Thunen's model

Unit III: Resources (10)

- i. Definition and classification of resources

- ii. Significance of natural and human resources in economic development
- iii. Importance of non-conventional energy resources for sustainable development

Unit IV: Economic Development (08)

- i. Definition and concept of economic development
- ii. Measures of economic development
- iii. Classification of countries on the basis of economic development
- iv. Rostow's and Myrdal's model

Unit V: Transport and Communication (08)

- i. Various modes of transport
- ii. Geographical factors and transportation
- iii. Various means of communication
- iv. Role of transport and communication in economy

Unit VI: Trade (08)

- i. Definition and types of trade
- ii. Factors affecting on international trade
- iii. Problems and prospects of international trade with reference to India

Unit VII: Economic Development in India (08)

- i. Pre and post-independence economic development in India
- ii. Green revolution in India
- iii. Need of new green revolution in India
- iv. concept of globalization and privatization.
- v. Regional disparities in India and Maharashtra
- iv. Economic development

Suggested Readings:

1. Alexander, J.W. (1977): Economic Geography, Prentice Hall of India Pvt. Ltd., New.
2. Lloyd, P. and Dicken, B. (1972): Location in Space: A Theoretical Approach to Economic Geography, Harper and Row, New York Methuen.
3. Mitra, A. (2002): Resource Studies, Sreedhar publishers, Kolkata.
4. Ray, P.K. (1997): Economic Geography, (P) Ltd., Calcutta. Reference Books:
5. Alexander, J.W. (1977): Economic Geography, Prentice Hall of India Pvt. Ltd., New.

6. Kanan Chatterjee (2015): Basics of Economic Geography.
7. Patil, S.G., Suryawanshi, R.S., Pacharne, S. and Choudhar, A.H. (2014): Economic Geography, Atharav Prakashan, Pune.
8. Ray, P.K. (1997): Economic Geography, New Central Book Agency (P) Ltd., Calcutta.
9. Prithwish Roy (2006): Resource Studies, New Central Book Agency (P) Ltd., Calcutta.
10. K. Siddhartha (2018): Economic Geography, Kisalaya publications PVT.LTD
11. <http://studymaterial.unipune.ac.in/>

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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -II	Paper – II
Course Code: MSC-GEO 212 T	Title of the course: Population Geography
Credits: 04	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will understand basic concepts in population geography.
2. Students will know about approaches and theories in population geography
3. Students will understand the dynamics of population and its role in population policies
4. Students will recognize causes of change in fertility, mortality and migration
5. Students will be able to apply knowledge of population geography in population planning.

Detailed Syllabus:

Unit I: Introduction (08)

- i. Definitions, nature and scope of Population Geography
- ii. Sources of population data: census, national sample survey, sample registration survey, NFHS, DLHS data

Unit II: Population Distribution (06)

- i. Population distribution in the world
- ii. Density of population in the world
- iii. Determinants of population distribution and density

Unit III: Theories of Population (08)

- i. Malthus' Theory of Population
- ii. Optimum Population Theory
- iii. Demographic Transition Model

- Unit IV: Fertility** (08)
- i. Concept of nuptiality and fertility
 - ii. Basic measures of fertility
 - ii. Levels and trend of fertility in world
 - iii. Determinants of fertility
 - iv. Theories of fertility: a. Theory of social capillarity b. Liebenstein's model of fertility decline
- Unit V: Mortality** (08)
- i. Concept of mortality & morbidity
 - ii. Basic measures of mortality
 - iii. Level and trend of mortality in world
- Unit VI: Migration** (06)
- i. Definition and types (Internal and International)
 - ii. Concept: refugee, brain-drain migration
 - iii. Determinants and consequences of migration.
 - iv. Lee's Theory of Migration
 - v. Ravenstein's laws of migration
 - vi. Push-pull factors of migration
- Unit VII: Population Composition** (08)
- i. Age-Sex Structure
 - ii. Literacy composition
 - iii. Occupational structure
 - iv. Economic Composition
 - v. Religious and Linguistic Composition
- Unit VIII: Population Development and Policies** (08)
- i. Human Development Index (HDI)
 - ii. Relation between population and development
 - iii. Current Population policy of India
 - iv. One-Child policy of China and its consequences

Suggested Readings:

1. Agarwala, S.N. (1977): India's population Problems, Tata McGraw Hill publishing Co. Ltd., New Delhi.
2. Bose Ashis et.al. (1974): Population in India's Development Vikas Publishing House, New Delhi, 1974.
3. Chandna R.C. (1986): Geography of Population concepts, Determinants and Patterns, Kalyani Publishers, New Delhi
4. Clarke J.I (1973): Population Geography, Pergamon Press, Oxford.
5. Clarke J.I. (1984): Geography and Population, Approaches and Applications, Pergamon Press, Oxford.
6. Crook Nigel (1997): Principles of Population and Development, Pergamon Press New York.
7. Garnier B.J. (1970): Geography of Population, Longman, London.
8. Pathak, K.B. and F. Ram, (1992): Techniques of Demographic analysis, Himalaya Publishing House, Bombay.
9. Sundaram K.V. and Sudesh Nangia (1986): Population Geography, Heritage Publications, Delhi
10. U N D P (2002): Human Development Report, Oxford.
11. Woods R. (1970): Population Analysis in Geography, Longman, London
12. Zelinsky Wilbur (1966): A Prologue to Population Geography Prentice Hall
13. Musmade Arjun, Sonawane Amit and Jyotiram More, (2015): Population & Settlement Geography, Diamond Publication, Pune.
14. <https://censusindia.gov.in/>
15. <https://mahades.maharashtra.gov.in/publications.do?pubId=DSA>
16. <https://ahmednagar.nic.in/document-category/dsa/>
17. <https://studymaterial.unipune.ac.in/>

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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -II	Paper – III
Course Code: MSC-GEO 213 T	Title of the course: Geography of Rural Settlement
Credits: 02	Total Lectures: 30 Hrs

Course Outcomes:

1. Students will well aware about historical evolution of settlements and its impact on place names
2. Students will understand factors affecting on settlements and will well aware about methods of measuring degree of dispersion and system of land division
3. Students will understand theories of rural land use
4. Students will well aware about morphogenesis of rural settlements and its transformation
5. Students will recognize types of houses in rural settlements

Detailed Syllabus:

Unit I: Introduction to Geography of Rural Settlements (04)

- i. Definition and Evolution of settlements
- ii. Historical, cultural and geographical aspects of settlements reflected in place names

Unit II: Growth and Distribution (06)

- i. Site, situation, location and factors influencing
- ii. Dispersion and nucleation and factors influencing on it

Unit III: Theories of Rural Land Use (06)

- i. Intensity of land use
- ii. Labour cost
- iii. Marketing of product

iv. Von Thunen Theory

v. Ricardo Theory

Unit IV: Rural Economic Activities (06)

i. Basic concepts: Central place, complementary region, range, threshold and hierarchy

ii. Centrality and hierarchy of rural service centers

iii. Central Place Theory

Unit V: Morphogenesis of Rural Settlements and Transformation (04)

i. Morphogenesis: Social, Cultural, Economic organization within villages

ii. Functional growth and Socio-economic transformation in rural areas

Unit VI: Rural House Types (04)

i. Primitive, vernacular and modern high rise

ii. Physical, social, cultural and economic factors influencing on rural house types

Suggested Readings:

1. Alam, S.M. et.al. (1982): Settlement System of India, Oxford and IBH Publication Co., New Delhi.
2. Chisholm M. (1967): Rural Settlement and Land use. John Wiley, New York.
3. Clout, H.D. (1977): Rural Geography, Pergamon, Oxford.
4. Doniel, P. and Hopkinson, M. (1986): The Geography of settlement Oliver &Byod, Edinburgh.
5. Grover, N. (1985): Rural Settlement: A Cultural Geographical Analysis. Inter India Publication, Delhi.
6. Hudson, F.S. (1976): A Geography of Settlements, Macdonald and Evans, New York.
7. Ramchandran, H. (1985): Village clusters and Rural Development. Concept Publication, New Delhi.
8. Rao R. N. (1986): Strategy for Integrated Rural Development. B.R. Publication, Delhi.
9. Sen, L.K. (1972): Readings in Micro-level Planning and Rural Growth Centers, National Institute of Community Development, Hyderabad.
10. Srinivas M.N. (1968): Village India, Asia Publication House, Bombay.

11. Wanmati S. (1983): Service Centers in Rural India, B.R. Publication Corporation, Delhi.
12. Musmade A.H., Sonawane AE, More JC, (2015): Population & Settlement Geography, (Marathi), Diamond Publication, Pune.
13. <https://censusindia.gov.in/>
14. <https://mahades.maharashtra.gov.in/publications.do?pubId=DSA>
15. <https://ahmednagar.nic.in/document-category/dsa/>
16. <https://studymaterial.unipune.ac.in/>

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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -II	Paper – IV
Course Code: MSC-GEO 214 P	Title of the course: Practicals in Economic Geography
Credits: 02	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will able to calculate crop-combination using Jasbir Singh's method
2. Students will able to measure agriculture efficiency using Kendall's method.
3. Students will able to calculate levels of agricultural productivity.
4. Students will able to use various techniques in industrial and transport geography.

Detailed syllabus:

Unit I: Techniques in Agricultural Geography (05)

- i. Crop-combination techniques - Jasbir Singh
- ii. Measurement of Agriculture efficiency-Kendall
- iii. Levels in agricultural productivity -crop yield and concentration indices ranking coefficient (Jasbir singh) with map.
- iv. Enyedi's productivity index of agriculture.

Unit II: Techniques in Industrial Geography (04)

- i. Location Quotient
- ii. Lorenz Curve
- iii. Von Thunian Model

Unit III: Techniques in Transport Geography (02)

- i. Graph theoretical measures of transport network indices
- ii. Gravity potential population surface.

iii. Breaking point theory - Trade area delimitation, Law of retail trade gravitation.

Unit IV: Case study

(01)

i. A case study of one local agro-based industry: Economic analysis, problems and prospects (Sugar factory/ winery/ agro-tourist center etc.)

Suggested Readings:

1. Singh, J. and Dhillon, S. S. (1994): Agricultural Geography, Tata McGraw Hills, New Delhi
2. Yeats, M. H. (1978): An introduction to quantitative analysis in human geography
3. Monkhouse, F. J. and Wilkison, H. R. (1976): Map and Diagrams, Methuen and Co.
4. Kansky, N. T. (1965): Structure of Transport Network.
5. <https://studymaterial.unipune.ac.in/>

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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -II	Paper – V
Course Code: MSC-GEO 215 P	Title of the course: Practicals in Surveying
Credits: 02	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will understand methods and important concepts of surveying
2. Students will well aware about components of dumpy level and will able to use it for surveying
3. Students will well aware about components of theodolite and will able to use it for surveying
4. Students will well aware about components of total station and will able to use it for surveying

Detailed Syllabus:

Unit I: Introduction to Surveying (02)

- i. Definitions and methods
- ii. Benchmarks
- iii. Spot heights
- iv. Reduced levels
- v. Interpolation and contouring

Unit II: Dumpy/Auto level (02)

- i. Various components and common terms used in dumpy level survey
- ii. Collimation method and Rise and Fall method
- iii. Profile drawing and block contouring

Unit III: Transit Theodolite (03)

- i. Various components and common terms used in Theodolite
- ii. Intersection method and Tachometric method

Unit IV: Total Station (03)

- i. Various components and common terms used in Total Station
- ii. Area and profile drawing

Unit V: Field Visit (02)

- i. Dumpy level/Theodolite /Total Station Survey of a Beach, River Profiles and Slope

Suggested Readings:

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

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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -II	Paper – VI
Course Code: MSC-GEO 216 P	Title of the course: Practicals in Map Projection
Credits: 02	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will understand concept of map projection and will well aware about types of map projection and their properties.
2. Students will able to construct various types of map projections.
3. Students will able to choose map projection according to need.

Detailed Syllabus:

Unit I: Map projections (03)

- i. Definition and necessity of projections
- ii. Types- Perspective and non- perspective, conventional
- iii. Classification based on
 - a) Developable surfaces used
 - b) Position of source of light
 - c) Properties

Unit II: Zenithal Projections (02)

- i. Zenithal Polar Gnomonic Projection
- ii. Zenithal Polar Stereographic Projection

Unit III: Conical Projections (02)

- i. Polyconic Projection
- ii. Bonne's Projection

Unit IV: Cylindrical Projections (02)

- i. UTM Projection
- ii. Cylindrical Equal Area Projection

Unit V: Conventional Map Projections (03)

- i. Mollweide Projection
- ii. Sinusoidal Projection

Graphical construction, properties and uses of these projections (2 exercise of each)

Suggested Readings:

1. Asis Sarkar (2015): Practical Geography, A Systematic Approach, Orient Black Swan
- Maling, DH. (1973): Coordinate systems and map projections, George Philip, London.
2. Richardus, P. and Adler Ron, K. (1972): Map projections, North Holland publ. Co., Amsterdam.
3. Saha, P. and Basu, P. (2007): Advanced Practical Geography, Books and Allied (P) Ltd. Kolkatta.
4. Steers, J.A. (1970): An Introduction to Study of Map Projections. University of London Press Ltd., London.
5. <https://studymaterial.unipune.ac.in/>

**Ahmednagar Jilha Maratha Vidya Prasarak Samaj's
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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -II	Paper – VII
Course Code: MSC-GEO 217 T (A)	Title of the course: Geoinformatics I
Credits: 02	Total Lectures: 30 Hrs

Course Outcomes:

1. Students will understand fundamentals of Geographical Information System.
2. Students will understand the structuring of spatial data and data analysis method in GIS.
3. Students will understand database and data model in GIS.
4. Students will aware about applications of Geoinformatics.

Detailed Syllabus:

Unit I: Introduction to GIS (05)

- i. Definition, potential of GIS
- ii. History of GIS
- iii. Objectives of GIS
- iv. Elements of GIS, hardware & software requirements
- v. GIS Applications
- vi. GIS Tasks- input, manipulation, management, query & analysis, visualization

Unit II: Geographic Data (Spatial and Non-Spatial Data) (05)

- i. Data Sources – Topographical Maps, GPS, Surveying and Satellite images
- ii. Spatial: spatial relationship, functional relationship, logical relationship
- iii. Non-spatial: nominal, ordinal, ratio and cyclic

Unit III: Data Models (06)

- i. Spatial: Geometric primitives, Raster, Vector, Quad tree tessellation, comparative overview of raster and vector models, layers and coverage
- ii. Non-spatial: DBMS- Advantages, hierarchical database structure, Network database structure, Relational database structure

Unit IV: Structuring of Spatial Data (06)

- i. Digitizers: manual, semi-automatic & automatic
- ii. Editing error: detection & correction, topology building - Connectivity, Containment, Contiguity

Unit V: Data Analysis (08)

- i. Attribute databases: operations from algebraic theory
- ii. Operations from set theory SQL: attribute query
- iii. Spatial Databases: Grid operation in map algebra: Local, Focal
- iv. SQL: spatial query
- v. Multilayer data analysis

Suggested Readings:

1. Burroughs, P. A. and Mc Donnell, R.A. (2002): Principles of Geographical Information System, Oxford University Press.
2. George J. (2004): Fundamentals of Remote Sensing, Universities Press Pvt. Ltd., Hyderabad.
3. Jensen, J. R. (2003): Remote Sensing of Environment, An Earth Resource Perspective, Pearson Education Pvt. Ltd., New Delhi.
4. Kang- Tsung-Chang (2002): Introduction to Geographical Information System, McGraw Hill, London,
5. Lillesand, T. M. and Kiefer R. W. (2002): Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
6. Lo C. P. and Yeung, A.K.W. (2002): Concepts and Techniques of Geographic Information System, Prentice Hall, India.
7. Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D W. Rhind, (2002): Introduction to Geographic Information Systems and Science, John Wiley and Sons Ltd.

8. https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/resource/tutor/fundam/pdf/fundamentals_e.pdf
9. www.iirs.gov.in

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**Syllabus of M.A./M.Sc. I Geography
(Under Faculty of Science and Technology)**

Semester -II	Paper – VIII
Course Code: MSC-GEO 217 T (B)	Title of the course: Coastal Geomorphology
Credits: 02	Total Lectures: 30 Hrs

Course Outcomes:

1. Students will understand components and classification of coastal geomorphology
2. Students will well aware about coastal processes
3. Students will understand the mechanism of coastal sediment
4. Students will recognize characteristics of coastal environment

Detailed syllabus:

Unit I: Introduction (03)

- i. Components of coastal systems processes, sediment transport Morphology, Stratigraphy
- ii. Coastal classification – Genetic and Morphological

Unit II: Coastal Processes (07)

- i. Waves: Definition, Types of waves, Process of shoaling, wave breakers – spilling, plunging and surging, reflection, diffraction and refraction of waves
- ii. Currents: Types of Currents, characteristics of currents
- iii. Tides: Equilibrium Theory of tides, semidiurnal, diurnal, spring, and neap tides. Amphidromic point, co – tidal lines, coastal tides, tides in bays and estuaries Tides and coastal landforms

Unit III: Sea level Mechanism (06)

- i. Transgression, Regression, Relative and eustatic sea level change

- ii. Causes and consequences sea level change Pleistocene Sea levels, glacial eustasy, Staircase theory
- iii. Holocene transgression
- iv. Future Sea levels
- v. Indicators of former sea levels: Fossil beach ridges, beach rocks, abandoned cliffs, Caves, raised features, shore platforms

Unit IV: Coastal sediments**(04)**

Properties, types and Movement

- i. Clastic and biogenic sediments
- ii. Grain size characteristics
- iii. Sources sediments: Coastline erosion and sea floor
- iv. Pathways of sediments transport: Factors affecting Transport, sediments traps and sinks

Unit V: Coastal environments**(06)**

- i. Fluvial-dominated landforms
- ii. Wave-dominated landforms
- iii. Tide-dominated landforms
- iv. Biotic environments –
 - a. Mangroove swamps and salt marshes
 - b. Corals and coral reefs

Unit VI: Applied coastal Geomorphology**(04)**

- i. Current coastal issues - a. Sea level rise b. Storm hazard management c. Coastal erosion d. Wetlands, Kharlands, Estuarine reclamation e. Salt intrusion and subsidence of coastal aquifers

Suggested Readings:

1. Davis J L (1980): Geographical variation in coastal development, Longman, New York
2. Embelton and Thornes (1979): Process in geomorphology, Arnold, London
3. Hails J and Carr A (1975): Nearshore sediment dynamics and sedimentation, Wiley, London
4. Karlekar Shrikant (1993): Coastal geomorphology of Konkan, Aparna Publication, Pune
5. Masselink G, Hughes M G (2003): Introduction to coastal processes and geomorphology, Arnold, London
6. Pethick John (1984): An Introduction to coastal geomorphology, Arnold Heinemann, London

7. Tooley M M and Shennan I (1987): Sea level changes, Basil Blackwell, Oxford, U K
8. Bird, E. (2000): Coastal Geomorphology. An Introduction, John Wiley and Sons , Chichester.
9. Kale, V.S. and Gupta, A. (2001): Introduction to Geomorphology, Orient Longman, Calcutta.
10. Jog S. R. and Suryawanshi R.S. (2004): Costal Landscape, Global Scientific, Pune
11. Karlekar Shrikant (2009) : Coastal processes and landforms, Diamond publication, Pune
12. BIRD (2009) Coastal Geomorphology: An Introduction
13. <https://studymaterial.unipune.ac.in/>

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**Syllabus of M.A./M.Sc. I Geography
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Semester -II	Paper – IX
Course Code: MSC-GEO 218 P (A)	Title of the course: Practicals in Geoinformatics I
Credits: 02	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will understand basics of aerial photography
2. Students will able to interpret satellite images
3. Students will understand raster and vector data

Detailed syllabus:

Unit I: Aerial Photography (03)

Measurements and Interpretation

- i. Scale and height (using parallax bar)
- ii. Visual Interpretation of single aerial photograph
- iii. Interpretation of stereo pair using Stereoscope

Unit II: Satellite Images (02)

- i. Visual interpretation of LISS, PAN, WiFS
- ii. Cartosat Data, IKONOS and Quick Bird

Unit III: Spatial Database (04)

Layer Generation

- i. Raster: Full Grid, Chain Codes and Run Length Codes
- ii. Vector: Manual Digitization, Digitization

Errors and Topology Building

Unit IV: GIS operations

(03)

- i. Raster and vector overlay, map algebra
(AND, OR) from a toposheet quadrant
- ii. Spatial interpolation from a toposheet quadrant

Suggested Readings:

1. P. A. Burrough and R. A. McDonnell, (2000): Principles of Geographical Information System, Oxford University Press.
2. C. P. Lo and Albert, K. W. Yeung (2002): Concepts and Techniques of Geographic Information System, 2002Prentice –Hall, India.
3. Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D.W. Rhind (2002): Introduction to Geographic Information Systems and Science, John Wiley and Sons Ltd.
4. Kang – Tsung – Chang, (2002): Introduction to Geographical Information System, McGraw Hill.
5. George Joseph, (2004): Fundamentals of Remote Sensing, Universities Press Pvt. Ltd., Hyderabad.
6. J. R. Jensen, (2003): Remote Sensing of Environment, An Earth Resource Perspective, Pearson Education Pvt. Ltd., New Delhi.
7. <https://studymaterial.unipune.ac.in/>
8. www.iirs.gov.in

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**Syllabus of M.A./M.Sc. I Geography
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Semester -II	Paper – X
Course Code: MSC-GEO 218 P (B)	Title of the course: Practicals in Coastal Geomorphology
Credits: 02	Total Lectures: 60 Hrs

Course Outcomes:

1. Students will able to identify coastal features using toposheets and satellite images
2. Students will able to analyze wave and tide data
3. Students will able to draw cross profiles of coastal features
4. Students will able to analyze coastal sediments.

Detailed syllabus:

Unit I: Identification of landforms	(01)
i. Identification of coastal features using topographical maps/ satellite images	
Unit II: Wave and Tide data analysis	(03)
i. Monitoring of wave parameters in surf zone and tide levels.	
ii. Wave and tide level data analysis.	
Unit III: Planimetric and cross profiles	(03)
i. Beach	
ii. Dune	
ii. Sand Bar	
Unit IV: Coastal Sediment	(02)
i. Sample collection and analysis of coastal sediments	

Unit V: Mapping

(03)

- i. Geomorphic mapping of coastal features
- ii. Observation and recording of Human activities in coastal area.

Suggested Readings:

1. Bloom, A. L. (2002): Geomorphology: A Systematic Analysis of Late Cenozoic, Landforms, Prentice-Hall of India, New Delhi
2. Carter, R. W. G. (1988): Coastal Environments, Academic press ltd., London
3. Dackombe, R. V. and Gardiner, V. (1983): Geomorphological Field Manual, George Allen and Unwin, London
4. Goudie, A. (1990): Geomorphological Techniques, Routledge, London
5. King, C. A. M. (1972): Beaches and Coasts, Edward Arnold, London
6. Pethick, J. (1984): An Introduction to Coastal Geomorphology, Arnold-Heinemann, London
7. Smith, M. J., Paron, P. and Griffiths, J. (2011): Geomorphological Mapping, Elsevier, Amsterdam
8. <https://studymaterial.unipune.ac.in/>

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**Syllabus of M.A./M.Sc. I Geography
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Semester -II	Paper – XI
Course Code: MSC-GEO 219 T	Title of the course: Introduction to Remote Sensing
Credits: 02	Total Lectures: 30 Hrs

Course Outcomes:

1. Students will well aware about basics of Remote Sensing
2. Students will able to interpret satellite image with the help of elements of visual image interpretation
3. Students will able to download image through Bhuvan and USGS
4. Students will able to layer stacking, image enhancement and image classification using software

Detailed Syllabus:

Unit I: Introduction to Remote Sensing (07)

1. Concept, Definition and Types of RS
2. Development of RS in India
3. Stages in RS
4. Electromagnetic Spectrum
5. Applications of RS

Unit II: Image Interpretation (07)

1. Elements of Visual Image Interpretation
2. Visual Image Interpretation of Satellite Images i.e. IRS or LANDSAT

Unit III: Software based Practical**(16)**

1. Image Downloading through Bhuvan/USGS
2. Layer Stacking
3. Image Enhancement
4. Image Classification - Unsupervised

Suggested Readings:

1. Anji Reddy, M. (2008): Textbook of Remote Sensing and Geographic Information System, B.S. Publication, Hyderabad.
2. Bhatta B., (2011): Remote Sensing and GIS, Oxford University Press, India.
3. Campbell, J. (2002): Introduction to Remote Sensing, Taylor & Francis, London.
4. Cracknell, A.P. (1991): Introduction to Remote Sensing, Tylor & Francis, London.
5. Gupta, R.P. (1990): Remote Sensing Geology. Springer Verlag.
6. Heywood, I., Steve, C. and Cornelius, S. (2003): An Introduction to Geographical Information Systems, Pearson Education.
7. Jensen, J. R. (2000): Remote Sensing of the Environment: An Earth resource Perspective, Prentice Hall.
8. Jensen, J. R. (2005): Introductory Digital Image Processing, Prentice Hall, New Jersey.
9. Joseph, G. (2004): Fundamentals of Remote Sensing, Universities Press, Hyderabad, India.
10. Karlekar, S. (2006): Doorsamvedan - Remote Sensing (Marathi), Diamond Publications, Pune.
11. Karlekar, S. (2017): Dursamvedan Aani Bhougolik Mahiti Pranali (Marathi), Diamond Publications, Pune.
12. Lillesand, T. M., Kiefer, R. W. and Chipman, J. W. (2016): Remote Sensing and Image Interpretation, 6 th Edition, Wiley India.
13. Rao R. M. (2002): Geographical Information Systems, Rawat Publication.
14. Sabins, F. F. (1996): Remote Sensing: Principles and Interpretation, W.H. Freeman and Company, San Francisco.
15. <https://studymaterial.unipune.ac.in/>
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