Punyashlok Ahilyadevi Holkar Solapur University, Solapur

NAAC Accredited-2022
'B^{++}' Grade (CGPA 2.96)

Name of the Faculty: Science & Technology

NEP STRUCTURE 2020

Syllabus: Geography

Name of the Course: M. A. / M. Sc. – I (Semester I & II)

(Syllabus to be implemented from June 2026)

- **Duration of Course** – 02 years

  The students have to record their daily attendance, 80 % attendance is must, otherwise the concerned will not be allowed for the examination. The students will be awarded the postgraduate degree only after the completion of course.
- **Fees structure -** As per the University rules and regulation. The fees to be paid in the beginning of the academic year.
- **Implant training** – It will be of minimum sixty hours duration, depending upon the type of industry…….
- **Objectives to be achieved**:
  - To enrich students with technical knowledge and train the min entrepreneurship.
  - To introduce the concepts of application of industrial to a successful entrepreneur.
  - To inculcate sense of scientific responsibilities and social and environment awareness.
  - To help the students inbuilding-up the progressive and successful career.
- **Eligibility-**

  B. A. / B. Sc. with Major / Principal subject like Geography
- **Mode of Selection-**

1. Degree examination score will be considered for 20 % weightage.
2. The University / College will conduct the entrance examination based on the specially designed and displayed syllabus on the website of PAH Solapur University Solapur. Entrance examination score will be considered for 80 % weightage.

- **Merit list will be displayed on the basis of (1) & (2) mentioned above.**

Credit Structure

<table>
<tr><th>Level/
Difficulty</th><th>Sem.</th><th colspan="2">Major</th><th>RM</th><th>OJT/FP</th><th>Credits</th><th>Cumulative
Credits</th></tr>
<tr><td rowspan="5">6.0/400</td><td></td><td>Mandatory</td><td>Elective</td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">I</td><td>DSC 1
(4 + 2)</td><td rowspan="2">DSE 1
(4 + 2)</td><td rowspan="2">RM
(4)</td><td rowspan="2"></td><td rowspan="2">22</td><td rowspan="4">44

PG
Diploma in
Discipline</td></tr>
<tr><td>DSC 2
(4 + 2)</td></tr>
<tr><td rowspan="2">II</td><td>DSC 3
(4 + 2)</td><td rowspan="2">DSE 2
(4 + 2)</td><td rowspan="2"></td><td rowspan="2">FP
(4)</td><td rowspan="2">22</td></tr>
<tr><td>DSC 4
(4 + 2)</td></tr>
<tr><td></td><td>Total</td><td>24</td><td>12</td><td>4</td><td>4</td><td>44</td><td></td></tr>
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M. A. / M. Sc. I (Geography)

Syllabus Structure - NEP2020 (w.e.f. June 2026)

Semester -I								
Paper Code	**Title of the Paper**	**Credits**	**Contact hours/week**			**Examination Pattern**		
			Th (L)	**Pr**	**Total**	**UA**	**CA**	**Total**
	Major Mandatory							
DSC-1 (T)	Principal of Geomorphology	4	4	-	4	60	40	100
DSC-2 (T)	Principal of Climatology	4	4	-	4	60	40	100
	Major Electives (Any one)							
DSE-1.1 (T)	Human Geography	4	4	-	4	60	40	100
DSE-1.2 (T)	Economic Geography	4	4	-	4	60	40	100
	Research Methodology							
RM (T)	Research Methodology in Geography	4	4	-	4	60	40	100
	Practical's							
DSC-1 (P)	Representation of Landform & Topographical Map	2	-	4	4	30	20	50
DSC-2 (P)	Study of Weather Maps	2	-	4	4	30	20	50
	Elective (Any one)							
DSE-1.1 (P)	Analysis of Socio-Economic Data -I	2	-	4	4	30	20	50
DSE-1.2 (P)	Representation of Socio-Economic Data	2	-	4	4	30	20	50
Total for Semester-I		**22**	**16**	**12**	**28**	**330**	**220**	**550**
Semester -II								
	Major Mandatory							
DSC-3 (T)	Applied Geomorphology	4	4	-	4	60	40	100
DSC-4 (T)	Applied Climatology	4	4	-	4	60	40	100
	Major Electives (Any one)							
DSE-2.1 (T)	Population Geography	4	4	-	4	60	40	100
DSE-2.2 (T)	Geography of Health	4	4	-	4	60	40	100
	Field Project							
FP (P)	Field Project in Geography	4	-	8	8	60	40	100
	Practical's							
DSC-3 (P)	Study of Landforms Analysis Techniques	2	-	4	4	30	20	50
DSC-4 (P)	Analysis of Climatic Data	2	-	4	4	30	20	50
	Elective (Any one)							
DSE-2.1 (P)	Practical in Population Geography	2	-	4	4	30	20	50
DSE-2.2 (P)	Analysis of Socio-Economic Data	2	-	4	4	30	20	50
Total for Semester-II		**22**	**12**	**20**	**32**	**330**	**220**	**550**

T / Th = Theory L= Lecture P / Pr = Practical

4 Credits of Theory = 4 Hours of teaching per week

2 Credits of Practical = 4 hours per week

DSC- Discipline Specific Course DSE- Discipline Elective course

RM- Research Methodology FP- Field Project

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Principal of Geomorphology

Paper Code: DSC- 1 (T) **Total Lectures - 60**

Course credit: 4 **Total Marks - 100**

Course Preamble:

Geomorphology is the scientific study of landforms, their origin, evolution, and the processes responsible for shaping the Earth's surface. This course introduces students to the fundamental concepts, nature, and scope of geomorphology and the development of geomorphic thought. It provides an understanding of the internal structure of the Earth and the theories explaining crustal balance and mountain building. The course examines geosynclinal concepts, convection currents, and various earth movements responsible for landscape development. It also explains endogenic and exogenic forces, including folding, faulting, earthquakes, volcanoes and weathering processes. The course enables students to understand the dynamic nature of the Earth's surface and landform evolution.

Course Objectives:

1) To introduce students to the basic concepts, principles, nature, and scope of Geomorphology.

2) To explain the structure of the Earth and major theories of isostasy and geosynclines.

3) To develop an understanding of endogenic and exogenic processes responsible for landform development.

4) To examine the role of earth movements, weathering, earthquakes, and volcanoes in shaping the Earth's surface.

Course Outcomes:

1) Students will be able to explain the fundamental concepts, scope, and historical development of Geomorphology.

2) Students will understand the internal structure of the Earth and critically evaluate theories of isostasy and geosynclines.

3) Students will analyze the effects of endogenic and exogenic forces on the evolution of landforms.

4) Students will assess the geomorphic significance of folding, faulting, earthquakes, volcanoes, and weathering processes.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Introduction to Geomorphology** 1.1 Meaning and Definition of Geomorphology 1.2 Nature and Scope of Geomorphology 1.3 Development of Geomorphic Thoughts: ancient, medieval and modern period 1.4 Principles of Uniformitarianism, Contribution of Huttan, Gilbert, Dutton and Davis.	15	1
2	**Earth's Interior and Theories of Isostacy** 2.1 Constitution of Earth's Interior 2.2 The Theories of Isostacy- Pratt, Airy and Joly	15	1
3	**Geosynclines** 3.1 Geosynclines theory of Kobber 3.2 Arthur Holms Theory of conventional currents	15	1
4	**Earth & Earth Movements** 4.1 Meaning of Endogenic and Exogenic forces 4.2 Slow movement – Folding & faulting 4.3 Sudden movement – Earthquake & Volcano 4.4 Meaning and types of Weathering	15	1

References:

1) Thornbury, W. D. (1969), Principles of Geomorphology, John Wiley and Sons, New York.

2) Holmes, A. (1983), Principles of Physical Geology, Thomas Nelson and Sons, London.

3) Strahler, A. N. and Strahler, A. H. (2006), Modern Physical Geography, John Wiley and Sons, New York.

4) Dayal, P. (1990), A Textbook of Geomorphology, Shukla Book Depot, Patna.

5) Singh, Savindra (2010), Geomorphology, Prayag Pustak Bhawan, Allahabad.

6) Kale, V. S. and Gupta, A. (2001), Introduction to Geomorphology, Orient Longman Publication, Hyderabad.

7) Worcester, P. G. (1948), A Textbook of Geomorphology, D. Van Nostrand Company, New York.

8) Monkhouse, F. J. (1970), Principles of Physical Geography, University of London Press, London.

9) Bloom, A. L. (1998), Geomorphology: A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall Publication, New Delhi.

10) Small, R. J. (1978), The Study of Landforms, Cambridge University Press, Cambridge.

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Structure of Syllabus (NEP 2020)

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

Title of the Paper: Principal of Climatology

Paper Code: DSC- 2 (T) **Total Lectures- 60**

Course credit: 4 **Total Marks-100**

Course Preamble:

Climatology is the scientific study of the atmosphere, weather elements, and climatic processes that influence life on Earth. This course introduces the composition and structure of the atmosphere and the mechanisms of solar radiation and heat balance. It explains the distribution of temperature, atmospheric pressure, and global wind systems. The course also examines the formation of monsoons, local winds, humidity, and atmospheric stability. Students will gain knowledge of evaporation, condensation, and different forms of precipitation. The course provides a foundation for understanding weather patterns, climate systems, and their geographical significance.

Course Objectives:

1) To introduce students to the fundamental concepts and processes of climatology and atmospheric science.

2) To explain the distribution and interaction of temperature, pressure, and wind systems in the atmosphere.

3) To develop an understanding of humidity, atmospheric stability, evaporation, condensation, and precipitation.

4) To examine the mechanisms of monsoons and local weather phenomena and their climatic significance.

Course Outcomes:

1) Students will be able to explain the composition, structure, and functioning of the Earth's atmosphere.

2) Students will understand the processes of insolation, heat balance, temperature distribution, and atmospheric circulation.

3) Students will analyze the formation and characteristics of pressure belts, winds, humidity, and precipitation.

4) Students will assess the role of atmospheric processes in shaping weather patterns and climatic conditions.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Atmosphere and Insolation** 1.1 Composition of the atmosphere 1.2 Structure of the atmosphere 1.3 Insolation & terrestrial heat balance 1.4 Temperature – Factors, Distribution and Inversion	15	1
2	**Atmospheric Pressure and Winds** 2.1 Pressure belts 2.2 Shifting of Pressure belts 2.3 Planetary winds 2.4 Mechanism of Monsoon and Local Winds	15	1
3	**Humidity** 3.1 Types of Humidity 3.2 Atmospheric Equilibrium- Stability & Instability 3.3 Concept of Evaporation and Condensation 3.4 Forms of Precipitation	15	1
4	**Air masses** 4.1 Types and properties of Air masses 4.2 Frontgenesis & Frontolysis Polar fronts & Inter Tropical Convergence Zone 4.3 Atmospheric Disturbances- i) Tropical cyclones- origin, distribution & weather associated with them ii) Mid latitude cyclones- Origin & distribution 4.4 Stages of cyclone –Weather associated with them	15	1

References:

1) Critchfield, H. J. (2002), General Climatology, Prentice Hall of India, New Delhi.

2) Trewartha, G. T. and Horn, L. H. (1980), An Introduction to Climate, McGraw Hill Publication, New York.

3) Barry, R. G. and Chorley, R. J. (2009), Atmosphere, Weather and Climate, Routledge Publication, London.

4) Lal, D. S. (2012), Climatology and Oceanography, Sharda Pustak Bhawan, Allahabad.

5) Singh, Savindra (2013), Climatology, Prayag Pustak Bhawan, Allahabad.

6) Oliver, J. E. and Hidore, J. J. (2003), Climatology: An Atmospheric Science, Pearson Education, New Delhi.

7) Lutgens, F. K. and Tarbuck, E. J. (2010), The Atmosphere: An Introduction to Meteorology, Pearson Prentice Hall, New Jersey.

8) Das, P. K. (1995), The Monsoons, National Book Trust, New Delhi.

9) Miller, A. A. (1966), Climatology, Methuen Publication, London.

10) Strahler, A. N. and Strahler, A. H. (2006), Modern Physical Geography, John Wiley and Sons, New York.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Human Geography

Paper Code: DSE – 1.1 (T) **Total Lectures - 60**

Course credit: 4 **Total Marks -100**

Course Preamble:

Human Geography is the study of human societies, cultures, populations, and their interactions with the environment. This course introduces the concepts, nature, scope, and significance of Human Geography and major philosophical approaches such as determinism and possibilism. It provides an understanding of human races, religions, and their spatial distribution across the world. The course examines population growth, distribution, composition, and important population theories. It also focuses on rural and urban settlements, patterns of urbanization, and the concept of human development. The course helps students understand the relationship between population, resources, and socio-economic development at regional and global levels.

Course Objectives:

1) To introduce students to the concepts, nature, scope, and significance of Human Geography.

2) To explain the characteristics and spatial distribution of human races, religions, and population.

3) To develop an understanding of population dynamics, composition, and major population theories.

4) To examine settlement patterns, urbanization processes, human development, and population-resource relationships.

Course Outcomes:

1) Students will be able to explain the fundamental concepts, approaches, and importance of Human Geography.

2) Students will understand the distribution and characteristics of human races, religions, and population patterns across the world.

3) Students will analyze population growth, composition, distribution, and the relevance of major population theories.

4) Students will assess settlement systems, urbanization trends, human development indicators, and the relationship between population and resources.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Introduction to Human Geography** 1.1 Definition and meaning of Human Geography 1.2 Nature & Scope of Human Geography 1.3 Determinism, Possibilism, Cultural or social determinism 1.4 Importance of Human Geography	15	1
2	**Human Race & Religion** 2.1 Human Race – Meaning 2.2 Basis of Racial Classification 2.3 Types of Human race 2.4 Religion in World - Christianity, Islam, Hinduism, Buddhism, Sikh and Jain	15	1
3	**Population** 3.1 Growth of World Population 3.2 Factors affecting on Distribution of World Population and Distribution of World Population 3.3 Population composition – Age and sex 3.4 Theories of Population- Malthus and Demographic Transition Theory	15	1
4	**Settlement & Human Development** 4.1 Types & functions of rural and urban settlements 4.2 Trends & Pattern of World Urbanization 4.3 Human Development: Historical Perspective, Human development Index & it's indicators, Spatial pattern of HDI, computing the HDI 4.4 Relationship between Population and Resource	15	1

References:

1) Hussain, Majid (2020). Principles of Human Geography. New Delhi: Rawat Publications.

2) Nand Kishore & Singh, R. C. (2015). Human Geography. New Delhi: Kitab Mahal Publishers.

3) Maurya, S. D. (2018). Human Geography. Prayagraj: Sharda Pustak Bhawan.

4) Ghosh, B. N. (2010). Human Geography. Kolkata: Books and Allied (P) Ltd.

5) Singh, R. Y. (2009). Geography of Settlements. New Delhi: Rawat Publications.

6) Chandna, R. C. (2017). Population Geography. New Delhi: Kalyani Publishers.

7) Knox, P. L. & Marston, S. A. (2015). Human Geography: Places and Regions in Global Context (7th Edition). Boston: Pearson Education.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Economic Geography

Paper Code: DSE – 1.2 (T) **Total Lectures - 60**

Course credit: 4 **Total Marks -100**

Course Preamble:

Economic Geography examines the spatial organization of economic activities and their relationship with natural and human resources. This course introduces the concepts, nature, scope, and basic processes of production, exchange, and consumption. It provides an understanding of the classification of economic activities and the factors influencing industrial location. The course explains major theories of industrial location and the significance of resources in economic development. It also focuses on energy resources, contemporary energy issues, transportation networks, and trade systems. The course enables students to analyze regional and global economic patterns and their role in development.

Course Objectives:

1) To introduce students to the concepts, nature, scope, and significance of Economic Geography.

2) To explain the spatial patterns of economic activities and the factors influencing industrial location.

3) To develop an understanding of resource utilization, energy issues, and resource conservation strategies.

4) To examine the role of transportation, trade networks, and international economic organizations in regional and global development.

Course Outcomes:

1) Students will be able to explain the concepts, principles, and scope of Economic Geography and economic processes.

2) Students will understand and critically evaluate major theories of industrial and economic location.

3) Students will analyze the classification, utilization, and management of resources, including contemporary energy issues.

4) Students will assess the significance of transportation, trade, SEZs, and international trade organizations in economic development.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Introduction to Economic Geography** 1.1 Meaning and Definitions of Economic Geography 1.2 Nature & Scope of Economic Geography 1.3 Basic Economic Processes - production, exchange & consumption 1.4 Classification of economic activities- primary, secondary, tertiary & quaternary – their characteristics.	15	1
2	**Theories in Economic Geography** 2.1 Factors affecting on Industrial Location 2.2 Industrial Location theories by Alfred Weber & August Losch	15	1
3	**Resources** 3.1 Concept of resource 3.2 Classification of resources 3.3 World Energy situation 3.4 Energy Crisis	15	1
4	**Transportation and Trade** 4.1 Accessibility and connectivity – Inter regional and international 4.2 Ullman's tried 4.3 Special Economic Zone (SEZ) 4.4 Trade organization –OPEC, WTO, EEC & SAARC	15	1

References

1) Husain, Majid (2021). Economic Geography (8th Edition). New Delhi: Rawat Publications.

2) Maurya, S. D. (2019). Economic Geography. Prayagraj: Sharda Pustak Bhawan.

3) Singh, Savindra (2018). Economic Geography. Prayagraj: Kitab Mahal Publishers.

4) Gopal Singh (2012). Economic Geography. New Delhi: Atma Ram & Sons.

5) Mamoria, C. B. & Mamoria, S. (2010). Economic and Commercial Geography of India. Agra: Shiva Lal Agarwala & Co.

6) Jones, C. F. & Darkenwald, G. G. (1975). Economic Geography. New York: Macmillan Publishing Company.

7) Hoover, E. M. (1948). The Location of Economic Activity. New York: McGraw-Hill.

8) Hartshorne, T. A. & Alexander, J. W. (1988). Economic Geography (3rd Edition). Englewood Cliffs, New Jersey: Prentice Hall.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur
Structure of Syllabus (NEP 2020)

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

Title of the Paper: Research Methodology in Geography

Paper Code: RM (T) **Total Lectures- 60**

Course credit: 4 **Total Marks-100**

Course Preamble:

Research Methodology in Geography provides a systematic understanding of scientific research processes and techniques used in geographical studies. This course introduces the meaning, objectives, significance, and various types of research. It focuses on the identification of research problems, literature review, and sampling techniques essential for conducting quality research. The course provides knowledge of primary and secondary data collection methods and techniques for geographical data analysis. It also develops skills in research design, report writing, referencing, and bibliography preparation. The course promotes ethical research practices by emphasizing academic integrity and the avoidance of plagiarism.

Course Objectives:

1) To introduce students to the concepts, objectives, and significance of research in Geography.

2) To develop the ability to identify research problems and apply appropriate sampling techniques.

3) To provide knowledge of geographical data collection methods and analytical techniques.

4) To train students in research design, report writing, referencing systems, and ethical research practices.

Course Outcomes:

1) Students will be able to understand and apply the fundamental principles and methods of geographical research.

2) Students will formulate research problems and select suitable sampling and data collection techniques.

3) Students will analyze geographical data using qualitative, quantitative, and advanced analytical methods.

4) Students will prepare research reports following proper scientific methodology, referencing standards, and ethical guidelines.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Introduction to Research Methodology** 1.1 Introduction: Meaning of Research, Objectives of Research 1.2 Types of Research 1.3 Significance of Research 1.4 Review of Literature: Significance and sources of literature review	15	1
2	**Research Problem and Sampling Design** 2.1. Concept of Research Problem and Selecting the Problem 2.2 Necessity of Defining the Problem, Technique Involved in Defining a Problem 2.3. Sampling: Meaning and importance 2.4 Types of sampling	15	1
3	**Collection and Analysis of Geographical Data** 3.1 Primary Data 3.2 Secondary Data 3.3 Analysis of Geographical Data: Qualitative, Quantitative and Advanced techniques	15	1
4	**Research Design** 4.1 Introduction- study area & objectives 4.2 Data and methodology 4.3 Data analysis, result, conclusion 4.4 Referencing system, bibliography and Plagiarism	15	1

References:

1) Kothari, C. R. (2004), Research Methodology: Methods and Techniques, New Age International Publishers, New Delhi.

2) Wilkinson, T. S. and Bhandarkar, P. L. (2010), Methodology and Techniques of Social Research, Himalaya Publishing House, Mumbai.

3) Singh, Savindra (2009), Research Methodology in Geography, Prayag Pustak Bhawan, Allahabad.

4) Mishra, R. P. (2002), Research Methodology: A Handbook, Concept Publishing Company, New Delhi.

5) Creswell, J. W. (2014), Research Design: Qualitative, Quantitative and Mixed Methods Approaches, Sage Publications, New Delhi.

6) Young, P. V. (1988), Scientific Social Surveys and Research, Prentice Hall of India, New Delhi.

7) Goode, W. J. and Hatt, P. K. (1981), Methods in Social Research, McGraw Hill Publication, New York.

8) Chorley, R. J. and Haggett, P. (1967), Models in Geography, Methuen Publication, London.

9) Ahuja, Ram (2001), Research Methods, Rawat Publications, Jaipur.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Representation of Landform and Topographical Map (Practical)

Paper Code: DSC-1 (P) **Total Lectures - 60**

Course credit: 2 **Total Marks - 50**

Course Preamble:

The practical course on Representation of Landform and Topographical Maps provides essential skills in map reading, interpretation, and relief representation. It introduces students to the concept, types, and indexing system of topographical maps. The course explains various methods of relief representation, including pictorial and mathematical techniques. It develops the ability to identify and interpret different landforms using topographical maps. Students gain practical experience in recognizing geomorphic features such as ridges, saddles, cols, passes, spurs, plateaus, escarpments, cliffs, and valleys. The course enhances spatial visualization and terrain analysis skills required in geographical studies. It provides a foundation for advanced geomorphological and cartographic investigations. The practical training helps students apply theoretical knowledge to real-world geographical analysis and mapping.

Course Objectives:

1) To introduce students to the concepts of maps, topographical sheets, and methods of relief representation.

2) To develop practical skills in identifying and interpreting landforms from topographical maps.

Course Outcomes:

1) Students will be able to identify and interpret various landforms and relief features using topographical maps.

2) Students will develop practical skills in map reading, terrain analysis, and relief representation techniques.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	A) Maps: Definition, Types of Maps, Indexing of Topographical Sheets B) Methods of Representation of Relief: i) Pictorial ii) Mathematical	30	1
2	Identification of Landforms from Topographical Maps: i) Ridge ii) Saddle iii) Col iv) Pass v) Spur vi) Plateau vii) Escarpment viii) Cliff ix) 'V' Shaped Valley	30	1

References:

1) Singh, R. L. and Dutt, P. K. (2010), Elements of Practical Geography, Kalyani Publishers, New Delhi.

2) Sharma, J. P. (2011), Practical Geography, Rastogi Publications, Meerut.

3) Monkhouse, F. J. and Wilkinson, H. R. (1971), Maps and Diagrams, Methuen Publication, London.

4) Khan, Zeenat (2012), Textbook of Practical Geography, Concept Publishing Company, New Delhi.

5) Gopal Singh (2014), Map Work and Practical Geography, Vikas Publishing House, New Delhi.

6) Robinson, A. H. et al. (1995), Elements of Cartography, John Wiley and Sons, New York.

7) Mishra, R. P. and Ramesh, A. (1989), Fundamentals of Cartography, Concept Publishing Company, New Delhi.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Study of Weather Maps (Practical)

Paper Code: DSC-2 (P) **Total Lectures - 60**

Course credit: 2 **Total Marks -50**

Course Preamble:

The practical course on Study of Weather Maps provides comprehensive training in the collection, presentation, and interpretation of weather and climatic data. It introduces students to the nature, sources, and significance of meteorological information used in climatological studies. The course develops skills in reading and interpreting Indian Daily Weather Reports and understanding weather forecasting techniques. Students learn to analyze weather information presented through television and other meteorological media. The course provides practical experience in the interpretation of upper air data and atmospheric conditions. It emphasizes the preparation and analysis of wind roses to understand wind direction and frequency patterns. Students are trained in constructing and interpreting isoline maps such as isotherms, isobars, and isohyets. The course also focuses on the preparation and interpretation of climatic diagrams including climographs and hythergraphs. Through practical exercises, students develop analytical and cartographic skills related to weather and climate studies. The course equips learners with essential competencies for climatological research, environmental analysis, and applied meteorology.

Course Objectives:

1) To develop practical skills in collecting, interpreting, and analyzing weather and climatic data.

2) To train students in the preparation and interpretation of weather maps, wind roses, isolines, and climatic diagrams.

Course Outcomes:

1) Students will be able to interpret weather reports, forecasts, and climatic data using standard meteorological techniques.

2) Students will develop practical competencies in preparing and analyzing weather maps, wind roses, isolines, climographs, and hythergraphs.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	I) Nature and Sources of climatic data II) Indian Daily Weather Reports, Formats, Reading and Interpretation III) Interpretation of weather broadcasting on television news Forecast IV) Analysis of Upper Air Data	30	1
2	I) Wind Roses- Simple, Compound and Octagonal II) Isolines: Isotherms, Isobars, Isohyets III) Climograph IV) Hydergraph	30	1

References:

1) Monkhouse, F. J. and Wilkinson, H. R. (1971), Maps and Diagrams, Methuen Publication, London.

2) Singh, R. L. and Dutt, P. K. (2010), Elements of Practical Geography, Kalyani Publishers, New Delhi.

3) Sharma, J. P. (2011), Practical Geography, Rastogi Publications, Meerut.

4) Gopal Singh (2014), Map Work and Practical Geography, Vikas Publishing House, New Delhi.

5) Khan, Zeenat (2012), Textbook of Practical Geography, Concept Publishing Company, New Delhi.

6) Lal, D. S. (2012), Practical Climatology, Sharda Pustak Bhawan, Allahabad.

7) India Meteorological Department (IMD) (2015), Indian Daily Weather Reports and Weather Map Symbols, Government of India Publication, New Delhi.

8) Robinson, A. H. et al. (1995), Elements of Cartography, John Wiley and Sons, New York.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Analysis of Socio-Economic Data-1 (Practical)

Paper Code: DSE-1.1 (P) **Total Lectures- 60**

Course credit: 2 **Total Marks - 50**

Course Preamble:

The practical course on Analysis of Socio-Economic Data–I focuses on the cartographic representation and spatial analysis of socio-economic phenomena. It provides students with practical knowledge of thematic mapping techniques used in geographical studies. The course introduces methods for representing population, resources, economic activities, and other socio-economic variables through maps. Students learn the preparation and interpretation of choropleth maps for showing regional variations. The course develops skills in the use of dot maps for depicting distribution patterns and density. It also provides training in constructing flow line maps to represent transportation and movement patterns. Students gain experience in preparing proportional circle maps for quantitative data representation. The course further introduces divided proportional circles and proportional spheres for the visualization of complex geographical information. Through practical exercises, students develop analytical, cartographic, and spatial interpretation skills.

Course Objectives:

1) To develop practical skills in the cartographic representation and analysis of socio-economic data using thematic mapping techniques.

2) To train students in the preparation, interpretation, and spatial analysis of choropleth, dot, flow line, and proportional symbol maps.

Course Outcomes:

1) Students will be able to prepare and interpret various thematic maps for representing socio-economic phenomena and spatial distributions.

2) Students will develop practical competencies in the cartographic visualization and geographical analysis of socio-economic data.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	1.1 Choropleth Maps: Mapping of Socio- phenomena 1.2 Dot Method & its relevance to distribution maps. 1.3 Flow line charts & maps of transport flow	30	1
2	2.1 Maps with proportional circles 2.2 Maps with divided proportional circles 2.3 Maps with proportional spheres	30	1

References:

1) Lawrence, G.R.P. (1973): Cartographic methods, Methuen & Co. London.

2) Mishra, R. P. (1982): Fundamental of cartography, Prasaranga, University Mysore.

3) Monkhouse, F.J.R & Wilkinson, H.R.: Maps & diagrams, Methuen & Co. London.

4) Raisz, Erwin: Principles of cartography, McGraw- Hill Book Co., New York. 1

5) Robinson A.H. & Sale R.D.: Element of Cartography, John House & Sons Ltd. London.

6) Singh R. L.: Elements of Practical Geography.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Representation of Socio-Economic Data (Practical)

Paper Code: DSE-1.2 (P) **Total Lectures- 60**

Course credit: 2 **Total Marks - 50**

Course Preamble:

The practical course on Representation of Socio-Economic Data focuses on the graphical presentation and interpretation of geographical and socio-economic information. It provides students with essential skills for transforming statistical data into meaningful visual forms. The course introduces one-dimensional diagrams such as line graphs and bar graphs for the representation of trends and comparisons. Students learn to prepare and interpret simple, multiple, joint, and compound diagrams. The course also covers two-dimensional diagrams, including proportional squares, proportional circles, divided rectangles, and divided circles. It provides practical training in representing quantitative and compositional data through appropriate graphical techniques. Students gain experience in constructing three-dimensional diagrams such as cube diagrams for comparative analysis. Through hands-on exercises, the course develops analytical, computational, and visualization skills. It enhances the ability to communicate geographical information effectively through diagrams and graphical presentations. The course prepares students for advanced geographical analysis, research, and data interpretation.

Course Objectives:

1) To develop practical skills in the graphical representation and interpretation of socio-economic and geographical data.

2) To train students in the preparation and analysis of one-dimensional, two-dimensional, and three-dimensional diagrams.

Course Outcomes:

1) Students will be able to construct and interpret various graphical techniques for representing socio-economic data.

2) Students will develop practical competencies in data visualization, comparison, and geographical data analysis using diagrams.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
I	**One Dimensional Diagrams:** 1.1 Line Graph – Simple and Multiple 1.2 Bar Graph - Simple, Joint and Compound	30	1
2	**Two and three dimensional diagrams** 2.1 Two dimensional diagrams: Proportional Square, Proportional Circle, Divided Rectangle, Divided Circle. 2.2 Three dimensional diagrams: Cube Diagrams	30	1

References:

1) Singh, R. L. and Dutt, P. K. (2010), Elements of Practical Geography, Kalyani Publishers, New Delhi.

2) Sharma, J. P. (2011), Practical Geography, Rastogi Publications, Meerut.

3) Monkhouse, F. J. and Wilkinson, H. R. (1971), Maps and Diagrams, Methuen Publication, London.

4) Khan, Zeenat (2012), Textbook of Practical Geography, Concept Publishing Company, New Delhi.

5) Singh, Gopal (2014), Map Work and Practical Geography, Vikas Publishing House, New Delhi.

6) Mishra, R. P. and Ramesh, A. (1989), Fundamentals of Cartography, Concept Publishing Company, New Delhi.

7) Robinson, A. H. et al. (1995), Elements of Cartography, John Wiley and Sons, New York.

8) Hussain, Majid (2010), Quantitative Techniques, Rawat Publications, Jaipur.

9) Singh, Savindra (2009), Statistical Methods in Geography, Prayag Pustak Bhawan, Allahabad.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Applied Geomorphology

Paper Code: DSC – 3 (T) **Total Lectures - 60**

Course credit: 4 **Total Marks - 100**

Course Preamble:

Applied Geomorphology examines the origin, evolution, and practical significance of landforms and geomorphic processes. This course introduces major theories explaining the formation of continents and ocean basins, including Continental Drift and Plate Tectonics. It provides an understanding of denudational processes and the development of landforms through fluvial, glacial, marine, aeolian, and karst activities. The course explains different concepts of slope development proposed by Davis, Penck, Wood, and King. It also highlights the application of geomorphological knowledge in understanding environmental problems and landscape management. The course enables students to analyze geomorphic hazards such as landslides, earthquakes, volcanoes, and floods from an applied perspective.

Course Objectives:

1) To introduce students to the theories explaining the origin and evolution of continents and ocean basins.

2) To develop an understanding of geomorphic processes and the formation of various landforms.

3) To examine different concepts and models of slope development in geomorphology.

4) To explain the applications of geomorphology in hazard assessment and environmental management.

Course Outcomes:

1) Students will be able to explain the origin and evolution of continents and ocean basins using major geomorphological theories.

2) Students will analyze geomorphic processes and landform development associated with different denudational agents.

3) Students will evaluate various theories of slope development and their geomorphological significance.

4) Students will assess the application of geomorphological knowledge in understanding and managing natural hazards and environmental issues.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Origin of Continents and Ocean Basins** 1.1 Evolution of Continents and Ocean basins 1.2 Alfred Wegener's Continental Drift Theory 1.3 Plate Tectonics Theory	15	1
2	**Geomorphic Process** 2.1 Concept of Cycle of erosion by W.M. Davis 2.2 Dynamic agencies of denudation Process-Weathering, Erosion and Mass Movement 2.3 Landforms associated with Fluvial, Glacial, Marine, Aeolian and Karst	15	1
3	**Slope Development** 3.1 Views of Davis 3.2 Views of Penk 3.3 Views of Wood 3.4 Views of Kings	15	1
4	**Applied Geomorphology** 4.1 Meaning & Definition of applied Geomorphology 4.2 Recent Trends in applied Geomorphology 4.3 Geomorphic Hazards-Landslide, Earthquake, Volcanoes and Flood	15	1

References:

1) Thornbury, W. D. (1969), Principles of Geomorphology, John Wiley and Sons, New York.
2) Strahler, A. N. and Strahler, A. H. (2006), Modern Physical Geography, John Wiley and Sons, New York.
3) Holmes, A. (1983), Principles of Physical Geology, Thomas Nelson and Sons, London.
4) Dayal, P. (1990), A Textbook of Geomorphology, Shukla Book Depot, Patna.
5) Singh, Savindra (2010), Geomorphology, Prayag Pustak Bhawan, Allahabad.
6) Kale, V. S. and Gupta, A. (2001), Introduction to Geomorphology, Orient Longman Publication, Hyderabad.
7) Worcester, P. G. (1948), A Textbook of Geomorphology, D. Van Nostrand Company, New York.
8) Monkhouse, F. J. (1970), Principles of Physical Geography, University of London Press, London.
9) Bloom, A. L. (1998), Geomorphology: A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall Publication, New Delhi.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Applied Climatology

Paper Code: DSC – 4 (T) **Total Lectures - 60**

Course credit: 4 **Total Marks -100**

Course Preamble:

Applied Climatology focuses on the practical applications of climate and weather in human activities, environmental management, and resource planning. This course introduces major climatic classifications and climatic regions of the world and India. It provides an understanding of agro-climatology, including droughts, irrigation scheduling, and agro-climatic regions. The course examines the influence of climate on human comfort, health, urban environments, and environmental issues such as air pollution and global warming. It also explores past climatic changes and their causes through the study of paleoclimatology. The course enables students to analyze contemporary climatic challenges and their implications for society and the environment.

Course Objectives:

1) To introduce students to major climatic classifications and climatic regions of the world and India.

2) To develop an understanding of agro-climatological concepts and their applications in agriculture and water management.

3) To examine the relationship between climate, human health, urban environments, and environmental issues.

4) To explain past and present climatic changes and their impacts on natural and human systems.

Course Outcomes:

1) Students will be able to classify and interpret different climatic regions using major climatic classification systems.

2) Students will analyze the role of climate in agriculture, drought management, and agro-climatic planning.

3) Students will evaluate the influence of climate on human comfort, health, urban environments, and environmental problems.

4) Students will assess the causes and consequences of past and recent climatic changes and their significance for sustainable development.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Climatic Classification** 1.1 General Climatic regions of the world 1.2 Climatic Classification of Koppen's & Thornthwaite's 1.3 Climatic regions of the India (Koppen)	15	1
2	**Agro-Climatology** 2.1 Droughts and Irrigation Scheduling 2.2 Agro-climatic regions of India	15	1
3	**Physical Climatology** 3.1 Role of clothing as providing insulation to human body 3.2 Physical climatology –(i) Climate and Human comfort (ii) Climate and health (iii) Urban Climate and Heat is land (iv)Air Pollution (v) Global Warming (vi) Ozone Layer Depletion	15	1
4	**Paleo-Climatology** 4.1 Climatic changes of the Geological periods - Causes and effects 4.2 Recent Climatic Changes – Causes and Consequences	15	1

References:

1) Critchfield, H. J. (2002), General Climatology, Prentice Hall of India, New Delhi.
2)Trewartha, G. T. and Horn, L. H. (1980), An Introduction to Climate, McGraw Hill Publication, New York.
3) Barry, R. G. and Chorley, R. J. (2009), Atmosphere, Weather and Climate, Routledge Publication, London.
4) Lal, D. S. (2012), Climatology and Oceanography, Sharda Pustak Bhawan, Allahabad.
5) Singh, Savindra (2013), Climatology, Prayag Pustak Bhawan, Allahabad.
6) Oliver, J. E. and Hidore, J. J. (2003), Climatology: An Atmospheric Science, Pearson Education, New Delhi.
7) Lutgens, F. K. and Tarbuck, E. J. (2010), The Atmosphere: An Introduction to Meteorology, Pearson Prentice Hall, New Jersey.
8) Miller, A. A. (1966), Climatology, Methuen Publication, London.
9) Strahler, A. N. and Strahler, A. H. (2006), Modern Physical Geography, John Wiley and Sons, New York.
10) Hobbs J. E. (1980): Applied Climatology, Buttrworth, London.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Population Geography

Paper Code: DSE-2.1 (T) **Total Lectures - 60**

Course credit: 4 **Total Marks - 100**

Course Preamble:

Population Geography is the study of the spatial distribution, composition, growth, and movement of human populations. This course introduces the concepts, nature, scope, and significance of Population Geography and the sources of population data. It provides an understanding of population growth, distribution patterns, and demographic characteristics at global and regional levels. The course examines the processes of fertility, mortality, and migration as key components of population change. It also explores population-resource relationships, population theories, and contemporary population issues. The course enables students to analyze population dynamics and evaluate population policies for sustainable development.

Course Objectives:

1) To introduce students to the concepts, nature, scope, and significance of Population Geography.

2) To explain the patterns and factors influencing population growth, distribution, and composition.

3) To develop an understanding of fertility, mortality, migration, and demographic transition processes.

4)To examine population-resource relationships, population theories, and population policies.

Course Outcomes:

1) Students will be able to explain the concepts, sources of data, and significance of Population Geography.

2) Students will analyze population growth, distribution, composition, and demographic characteristics at different scales.

3) Students will evaluate the determinants and measures of fertility, mortality, migration, and population change.

4) Students will assess population-resource relationships, population problems, and the effectiveness of population policies in India and China.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Introduction of Population Geography** 1.1 Definition of Population Geography 1.2 Nature and Scope of Population Geography 1.3 Significance of Population Geography 1.4 Source of population data	15	1
2	**Growth and Distribution of Population** 2.1 Growth of population in world 2.2 Factor affecting on population distribution 2.3 Population distribution pattern in world 2.4 Population composition: Age and Sex	15	1
3	**Population change** 3.1 Fertility – Measures and factor affecting on them 3.2 Mortality – Measures and factor affecting on them 3.3 Migration- Types and causes 3.4 Demographic transition theory	15	1
4	**Population & Resources** 4.1 Concept of optimum, over & under population 4.2 Malthus's theory of Population Growth 4.3 Growth of Population problems 4.4 Population policies - China and India	15	1

References:

1. Chandana R. C. &Manjit K. Siddhu (1980): Introduction to population Studies Geography, Kalyani Publishers New, Delhi.
2. Chandana R. C. (1984): Geography of population, Kalyani Publisher, Ludhiana.
3. Gamier, J.B. (1976): Geography population, Longman Group Ltd. London.
4. George J. Demo et.al. (1970): Population Geography: A Reader, McGraw Hill Book Co. New York.
5. Hausier, Philip M. & Dumcan (Eds.) (1959): The study of Population, University Press, Oxford.
6. Hussein, Majid (1999): Human Geography (2 Ed.) Rawat Publications, Jaipur.
7. John l. Clarke (1972): Population Geography indeed, Pergamon Press, Oxford.
8. Kingsley davis (1951): Population of India & Pakistan, Princeton University Press, Princeton.
9. Ravenstein E (1889): The Laws of Migration, Journal, Royal Statistical Society.
10. Sinha V.C. (1979): Dynamics of India's Population Growth, National Publishing House, New Delhi.
11. Smith, T. L. (1960): Fundamental of Population Studies, Lipincoll. London
12. Trewartha, G.T. (1953): A case for Population Geography, Annals of the Association of Geographers, June, pp71-97.
13. Trewartha G. T. (1959): A Geography of Population; World patterns, John Wiley & Sons Inc. New York.
14. Zelinsky, M. cl. Al. (1970): Geography & Crowding World, Oxford University Press, New York. 15. Sawant & Athawale A. S.: Population Geography, Mehta

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Geography of Health

Paper Code: DSE-2.2 (T) **Total Lectures- 60**

Course credit: 4 **Total Marks-100**

Course Preamble:

Geography of Health is a specialized branch of Human Geography that studies the spatial distribution of health conditions, diseases, and healthcare facilities. The course introduces students to the concepts, nature, scope, and significance of health geography in understanding human well-being. It examines the influence of physical, social, economic, and environmental factors on health and disease patterns. The course provides an understanding of the classification and distribution of communicable, non-communicable, occupational, and deficiency diseases. It explores the ecology, etiology, and modes of transmission of major diseases affecting human populations. Special emphasis is given to the geographical dimensions of diseases such as cholera, malaria, tuberculosis, hepatitis, leprosy, and cancer. The course also addresses contemporary health issues including AIDS, COVID-19, and the problem of malnutrition in India.

Course Objectives:

1) To introduce students to the concepts, nature, scope, and significance of Geography of Health.

2) To examine the physical, social, economic, and environmental factors affecting human health and diseases.

3) To understand the classification, distribution, and determinants of major communicable and non-communicable diseases.

4) To analyze contemporary health issues and public health challenges from a geographical perspective.

Course Outcomes:

1) Students will be able to the concepts, scope, and significance of Geography of Health.

2) Students will analyze the factors influencing human health and disease distribution.

3) Students will assess the classification, transmission, and spatial patterns of major diseases.

4) Students will evaluate contemporary health issues such as AIDS, COVID-19, and malnutrition and their geographical implications.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Introduction to Geography of Health** 1.1 Meaning and Definition of Health geography 1.2 Nature of Health geography 1.3 Scope of Health geography 1.4 Significance of geography of Health	15	1
2	**Factors Affecting on Human Health and Diseases** 2.1 Physical factors: relief, climate, soils and vegetation 2.2 Social factors: Population density, literacy, social customs and poverty 2.3 Economic factors: food and nutrition 2.4 Environmental factors: Urbanization and pollution	15	1
3	**Classification of Human Diseases** 3.1 Communicable and non communicable 3.2 Occupational and deficiency diseases 3.3 WHO's classification of diseases 3.4 Pattern of World distribution of major diseases	15	1
4	**Ecology, etiology and transmission of major diseases** 4.1 Cholera, Malaria & Tuber culosis 4.2 Hepatits, Leprosy & Cancer 4.3 Contemporary Issues- AIDS and COVID 19 4.4 Problems of malnutrition in India	15	1

References:

1) Banerjee B. and Hazra J: Geo-Ecology of Cholera in West Bengal, University of Calcutta, 1980

2) Hazra J. (ed): Health care planning in Developing countries, university of Calcutta, 1997

3) Learmonth A. T. A: Patterns of Disease and hunger, A study in medical Geography; David & Charles Victoria, 1978.

4) May J. M.: Studies in Disease Ecology, Hafner Publication, New York, 1961.

5) May J. M.: Ecology of Human Disease, M. D. Publication, New York, 1959.

6) May J. M.: The World Atlas of Diseases, Nal Book Trust, New Delhi, 1970.

7) MC Glashan, N. D.: Medical Geography; Methuen, London, 1972.

8) Pyle G: Applied medical Geography, Winston Halsted Press, Silver springs Md, U.S.A., 1979.

9) Rais, A and Learmonth, A.T.A. Geographical Aspects of Health and Diseases in India.

10) Cliff. A and Haggett, P.: Atlas of Disease Distribution Basil Blackwell, Oxford, 1989.

11) Digby, A and stawart, L. (Eds) Gender, Health and welfare, Routledge, New York, 1996.

12) Narayan K. V.: Health and Development. Inter Sectoral Linkages in India. Rawat Pub. Jaipur, 1997.

13) Phillips, D. R: Health and Health care in the third world, Longman, London, 1990.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Field Project in Geography

Paper Code: FP (P) **Total Lectures – 120**

Course credit: 4 **Total Marks -100**

Course Preamble:

Field Project in Geography is an essential practical course that provides students with hands-on experience in geographical investigation and research. This course introduces the role, value, ethics, and significance of fieldwork in geographical studies. It develops skills in selecting study areas and applying appropriate field techniques for data collection. The course provides practical training in observation, questionnaires, interviews, group discussions, and field survey methods. Students gain experience in collecting and analyzing physical and socio-economic data from the field. The course enables learners to prepare scientific field reports and develop research, analytical, communication, and presentation skills through report writing and viva-voce examination.

Course Objectives:

1) To introduce students to the principles, ethics, and significance of fieldwork in geographical research.

2) To develop skills in the selection and application of appropriate field survey techniques and data collection methods.

3) To provide practical experience in collecting, analyzing, and interpreting physical and socio-economic data.

4) To train students in scientific report writing, presentation, and geographical research practices.

Course Outcomes:

1) Students will be able to conduct geographical field surveys using appropriate fieldwork techniques and ethical practices.

2) Students will demonstrate the ability to collect, organize, and analyze primary geographical data from the field.

3) Students will apply suitable research methods for investigating physical and socio-economic geographical phenomena.

4) Students will prepare and present a scientific field report with proper interpretation, analysis, and conclusions.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Field Work** 1.1 Field Work–Role, Value, Data and Ethics, 1.2 Identifying the Case Study - Rural/Urban/Physical/Human/ Environmental	30	1
2	**Field Techniques** 2.1 Merits and Demerits 2.2 Selection of the Appropriate Technique: 2.2.1 Observation (Participant / Non-Participant), 2.2.2 Questionnaires (Open/ Closed / Structured / Non-Structured) 2.2.3 Interview with Special Focus on Focused Group 2.2.4 Discussions Space Survey (Transects and Quadrants, Constructing a Sketch)	30	1
3	**Field Survey** 3.1 Collection of Material for Physical 3.2 Socio-Economic	30	1
4	**Report Writing and viva - voce** 4.1 Introduction, Objectives, Sources of Data and Methodology, Analysis of data 4.2 Interpretation, Writing the Report	30	1

Practical Record:

1) Each student will prepare an individual report based on primary and secondary data collected during fieldwork.

2) The duration of the field work should not exceed 10 days.

3) The word count of the report should be about **8000 to 12,000** excluding figures, tables, photographs, maps, references and appendices.

4) One copy of the report on A 4 size paper should be submitted in hard binding.

References:

1) Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.

2) Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.

3) Evans M., 1988: “Participant Observation: The Researcher as Research Tool” in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.

4) Mukherjee, Neela 1993. Participatory Rural Appraisal: Methodology and Application. Concept Publs. Co., New Delhi.

5) Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Publs. Co., New Delhi

6) Robinson A., 1998: "Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.

7) Singh, Savindra (2009), Research Methodology in Geography, Prayag Pustak Bhawan, Allahabad.

8) Stoddard R. H., 1982: Field Techniques and Research Method

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Study of Landforms Analysis Techniques (Practical)

Paper Code: DSC-3 (P) **Total Lectures - 60**

Course credit: 2 **Total Marks - 50**

Course Preamble:

The practical course on Study of Landform Analysis Techniques provides students with essential skills in the identification, mapping, and quantitative analysis of geomorphic features. The course introduces techniques for recognizing and classifying different drainage patterns from topographical maps. It develops practical understanding of stream network analysis through Strahler stream ordering and the calculation of bifurcation ratios. Students learn methods for calculating drainage density and interpreting drainage characteristics of different regions. The course also focuses on the identification and mapping of various slope forms and their geomorphological significance. Practical training is provided in the measurement and analysis of slope gradients using different methods. Through map-based exercises, students develop skills in terrain interpretation and landform analysis. The course strengthens analytical and cartographic abilities required for geomorphological investigations. It provides a foundation for advanced studies in geomorphology, watershed management, and environmental planning.

Course Objectives:

1) To develop practical skills in the identification, mapping, and quantitative analysis of drainage patterns and stream networks.

2) To train students in the identification, measurement, and interpretation of different slope forms and gradient calculations.

Course Outcomes:

1) Students will be able to identify, classify, and analyze drainage patterns, stream orders, bifurcation ratios, and drainage density.

2) Students will develop practical competencies in slope mapping, gradient calculation, and terrain analysis using topographical data.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Identification and Mapping of Drainage Pattern** 1.1 Types of Drainage Pattern- Dendratic, Trellies, Radial and Centrifugal 1.2 Strahler Stream Ordering Calculation of Bifurcation Ratio 1.3 Calculation of Drainage Density	30	1
2	**Identification and Mapping of Slopes** 2.1 Types of Slope- Steep, Gentle, Uniform, Undulating, Concave, Convex and Terraced (Two Examples each) 2.2 Calculation of Gradient- By Gradient, By Degree, By Per cent and By Mills	30	1

References:

1) Singh, R. L. and Dutt, P. K. (2010), Elements of Practical Geography, Kalyani Publishers, New Delhi.

2) Sharma, J. P. (2011), Practical Geography, Rastogi Publications, Meerut.

3) Monkhouse, F. J. and Wilkinson, H. R. (1971), Maps and Diagrams, Methuen Publication, London.

4) Khan, Zeenat (2012), Textbook of Practical Geography, Concept Publishing Company, New Delhi.

5) Gopal Singh (2014), Map Work and Practical Geography, Vikas Publishing House, New Delhi.

6) Robinson, A. H. et al. (1995), Elements of Cartography, John Wiley and Sons, New York.

7) Mishra, R. P. and Ramesh, A. (1989), Fundamentals of Cartography, Concept Publishing Company, New Delhi.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Analysis of Climatic Data (Practical)

Paper Code: DSC – 4 (P) **Total Lectures - 60**

Course credit: 2 **Total Marks -50**

Course Preamble:

The practical course on Analysis of Climatic Data provides training in the graphical representation and interpretation of climatic information. It introduces students to statistical and graphical techniques used in climatological analysis. The course develops skills in constructing trend line graphs to identify long-term climatic variations and patterns. Students learn the application of moving averages and semi-average methods for trend analysis of climatic data. The course provides practical experience in the preparation and interpretation of dispersion graphs for rainfall and temperature data. It also emphasizes the construction and analysis of hythergraphs to understand the relationship between temperature and precipitation. Through practical exercises, students develop analytical and quantitative skills for climatic studies. The course enhances the ability to interpret climatic trends and variability for geographical research and environmental planning. It provides a foundation for advanced climatological analysis and applied climate studies.

Course Objectives:

1) To develop practical skills in the graphical representation and trend analysis of climatic data using statistical techniques.

2) To train students in the preparation, interpretation, and analysis of climatic graphs and diagrams such as moving averages, semi-averages, dispersion graphs, and hythergraphs.

Course Outcomes:

1) Students will be able to prepare and interpret trend line graphs, moving averages, and semi-average graphs for climatic data analysis.

2) Students will develop practical competencies in analyzing rainfall and temperature patterns through dispersion graphs and hythergraphs.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Trend Line Graphs and its Graphical Analysis** 1.1 Moving Averages Line-Three and Five Years 1.2 Semi Average Line – Odd and Even Years	30	1
2	**Graphical Analysis** 2.1 Dispersion Graphs – Rainfall and Temperature 2.2 Hythergraph	30	1

References:

1) Lal, D. S. (2012), Practical Climatology, Sharda Pustak Bhawan, Allahabad.

2) India Meteorological Department (IMD) (2015), Indian Daily Weather Reports and Climatological Tables, Government of India Publication, New Delhi.

3) Monkhouse, F. J. and Wilkinson, H. R. (1971), Maps and Diagrams, Methuen Publication, London.

4) Robinson, A. H. et al. (1995), Elements of Cartography, John Wiley and Sons, New York.

5) Singh, R. L. and Dutt, P. K. (2010), Elements of Practical Geography, Kalyani Publishers, New Delhi.

6) Sharma, J. P. (2011), Practical Geography, Rastogi Publications, Meerut.

7) Khan, Zeenat (2012), Textbook of Practical Geography, Concept Publishing Company, New Delhi.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Practical in Population Geography (Practical)

Paper Code: DSE-2.1 (P) **Total Lectures- 60**

Course credit: 2 **Total Marks - 50**

Course Preamble:

The practical course on Population Geography provides students with essential skills in the analysis, measurement, and cartographic representation of population data. It introduces techniques for studying population structure through age-sex pyramids and demographic indicators. The course develops practical knowledge of calculating child-women ratios, dependency ratios, infant mortality rates, and age-specific mortality rates. Students learn methods for measuring population change and preparing population projections. The course also focuses on the graphical and cartographic representation of population data using various mapping techniques. Practical training is provided in the preparation and interpretation of dot maps, choropleth maps, and flow line graphs. Through hands-on exercises, students develop quantitative, analytical, and mapping skills in population studies. The course enhances the ability to interpret demographic patterns and population characteristics. It provides a foundation for demographic analysis, population planning, and geographical research.

Course Objectives:

1) To develop practical skills in the measurement, analysis, and interpretation of demographic indicators and population characteristics.

2) To train students in the preparation and cartographic representation of population data using various mapping techniques.

Course Outcomes:

1) Students will be able to calculate and interpret demographic measures such as age-sex composition, dependency ratio, mortality rates, and population projections.

2) Students will develop practical competencies in the graphical and cartographic representation of population data using dot maps, choropleth maps, and flow line graphs**.**

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Age-Sex Pyramid** 1.1 Age-Sex Pyramid, Child-Women Ratio, Dependency Ratio 1.2 Infant Mortality Rate, Age Specific Mortality Rate of Population Change, Population Projection	30	1
2	**Methods of Representing and Mapping of Population Data** 2.1 Dot Method, 2.2 Choropleth Method 2.3 Flow line graph (population)	30	1

References:

1) Singh, R. L. and Dutt, P. K. (2010), Elements of Practical Geography, Kalyani Publishers, New Delhi.

2) Sharma, J. P. (2011), Practical Geography, Rastogi Publications, Meerut.

3) Monkhouse, F. J. and Wilkinson, H. R. (1971), Maps and Diagrams, Methuen Publication, London.

4) Khan, Zeenat (2012), Textbook of Practical Geography, Concept Publishing Company, New Delhi.

5) Singh, Gopal (2014), Map Work and Practical Geography, Vikas Publishing House, New Delhi.

6) Mishra, R. P. and Ramesh, A. (1989), Fundamentals of Cartography, Concept Publishing Company, New Delhi.

7) Robinson, A. H. et al. (1995), Elements of Cartography, John Wiley and Sons, New York.

8) Hussain, Majid (2010), Quantitative Techniques, Rawat Publications, Jaipur.

9) Singh, Savindra (2009), Statistical Methods in Geography, Prayag Pustak Bhawan, Allahabad.

Punyashalok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

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

Title of the Paper: Analysis of Socio-Economic Data (Practical)

Paper Code: DSE-2.2 (P) **Total Lectures- 60**

Course credit: 2 **Total Marks - 50**

Course Preamble:

Techniques of Socio-Economic Data Analysis is a practical course designed to develop skills in the graphical presentation and interpretation of socio-economic data. The course introduces students to advanced statistical diagrams and graphical methods used in geographical analysis and research. It provides practical training in constructing compound and superimposed pyramids for comparative data analysis. Students learn to use triangular graphs for representing relationships among three interrelated variables. The course also covers cumulative graphs, deviational graphs, scatter diagrams, and square diagrams for analyzing trends, distributions, and correlations. Practical exercises help students understand patterns, variations, and relationships within socio-economic data. Emphasis is given to the selection of appropriate graphical techniques for effective data visualization and interpretation. Overall, the course enhances students' quantitative, analytical, and presentation skills essential for geographical studies and socio-economic research.

Course Objectives:

1) To develop practical skills in the construction, analysis, and interpretation of advanced graphs and diagrams used in socio-economic studies.

2) To enable students to apply appropriate graphical techniques for visualizing, comparing, and analyzing socio-economic data.

Course Outcomes:

1) Students will be able to prepare and interpret various graphical techniques such as pyramids, triangular graphs, cumulative graphs, and deviational graphs.

2) Students will be able to analyze socio-economic data, identify relationships among variables, and present findings effectively using appropriate diagrams and graphs.

Contents of the course

Unit No.	Details	No. of Lectures	No. of Credits
1	**Graph and Diagram - I** Compound Pyramids, Superimposed Pyramids, Triangular Graph-Linear- relationship Variables	30	1
2	**Graph and Diagram - II** Cumulative Graph, Deviational Graph, Scatter Diagram, Square diagram	30	1

References:

1. Lawrence, G.R.P. (1973): Cartographic methods, Methuen and Co. London.
2. Mishra, R. P. (1982): Fundamental of cartography, Prasaranga, University Mysore.
3. Monkhouse, F.J.R & Wilkinson, H.R.: Maps & diagrams, Methuen and Co. London.
4. Raisz, Erwin: Principles of cartography, McGraw- Hill Book Co., New York.
5. Robinson A.H. & Sale R.D.: Element of Cartography, John House and Sons Ltd. London.
6. Singh R. L.: Elements of Practical Geography