Punyashlok Ahilyadevi Holkar Solapur University, Solapur

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

Name of the Faculty: Science & Technology

New Education Policy 2020

Syllabus: Geography

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

(Syllabus to be implemented from June 2023)

- **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 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

Level/ Difficulty	**Sem.**	**Major**		**Minor**	**Open Elective OE**	**Vocational & Skill Enhancement Courses (AEC), IKS, VEC**	**Field Project/RP/CC/Internship/Apprenticeship/ Community Engagement & Services**	**Credits**	**Cumulative credits**
		Mandatory	**Elective**						
6.0/400	I	DSC 1 (4+2)	DSE 1 (4+2)	RM (4) (Research Methodology)	-----	--------	----------	22	44 PG Diploma in Discipline
		DSC 2 (4+2)							
	II	DSC 3 (4+2)	DSE 2 (4+2)	-------	-------	------	FP/OJT/In house Project/Internship/Apprenticeship (04)	22	
		DSC 4 (4+2)							
	Total – I year	**24**	**12**	**04**			**04**	**44**	

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

Semester I & II

(NEP June, 2023) Syllabus Structure

Semester I											
Level/ Difficulty	**Semester**	**Paper**	**Title of the Paper**	**Semester exam**			**L**	**T**	**P**	**Credit**	
		Code	**Mandatory**	**Theory**	**IA**	**Total**		**s**			
		DSC-1	Principal of Geomorphology	80	20	100	4	--	-	4	
		DSC-2	Principal of Climatology	80	20	100	4		-	4	
			Elective (Any one)								
		DSE-1.1	Human Geography	80	20	100	4		-	4	
		DSE-1.2	Economic Geography	80	20	100	4		-		
			Minor								
		RM	Research Methodology	80	20	100	4	-	0	4	
			Practical								
		DSC-1(P)	Representation of Landforms & Topographical Map	40	10	50	-	-	2	6	
	I	**DSC-2(P)**	Study of Weather Map	40	10	50	-	-	2		
			Elective (Any one)								
		DSE-1.1(P)	Analysis of Socio-Economic Data -I	40	10	50			2		
		DSE-1.2 (P)	Representation of Socio-Economic Data	40	10	50			2		
			Total for I semester	**440**	**110**	**550**	**16**	**550**	**6**	**22**	
	SEMISTER II										
			Mandatory								
		DSC-3	Applied Geomorphology	80	20	100	4	--	-	4	
6.0/400		**DSC-4**	Applied Climatology	80	20	100	4		-	4	
			Elective (Any one)								
		DSE-2.1	Population Geography	80	20	100	4		-	4	
		DSE-2.2	Geography of Health	80	20	100	4		-		
			Minor								

		FP/OJT/In house Project/Internship/Apprenticeship	Field Project in Geography	80	20	100	-	-	4	4
	II		**Practical**							
		DSC-3 (P)	Study of Landforms Analysis Techniques	40	10	50	-	-	2	6
		DSC-4 (P)	Analysis of Climatic Data	40	10	50	-	-	2	
			Elective (Any one)							
		DSE-2.1 (P)	Practical in Population Geography	40	10	50			2	
		DSE-2.2 (P)	Analysis of Socio-Economic Data	40	10	50			2	
			Total for II semester	**440**	**110**	**550**	**16**	**550**	**6**	**22**

L= Lecture, T = Tutorials, P = 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

OJT- On Jon Training

FP- Field Project

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

Structure of Syllabus (NEP 2020)

For M. A. / M. Sc. Part- I Semester –I

Name of the Paper: Principal of Geomorphology

Paper Code: DSC -1 **Total Lectures- 60**

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

Preamble:

Geomorphology is the branch of Physical geography. It is the scientific study of the origin and evolution of topographic and bathymetric features created by physical, chemical, biological processes and operating on the earth surface. The changing dynamic nature of landform not only one of the natural phenomena but also its intensive effect on human beings. In the processes of settlement, agriculture, industrial, trade, transport and communication development physiography play an important role. This will further help the land use pattern. Therefore, geomorphologist work within this discipline the broad base of interests contributes too many research styles and interest within the field

Objectives:

1) To familiarize the students with certain fundamental Geomorphological concepts, interior of the Earth, mountain building theories and movement of the Earth.

2) To Understands the overall processes of weathering, mass movement and hill slope models.

Learning Outcomes: After completing the course, students will be able to

1) The students were understanding the development of geomorphic thought throughout the time with a review of fundamental concepts of geomorphology.

2) The student were familiar the knowledge about interior structure of the earth,

3) Know the endogenetic and exogenetic forces controlling landform development with special reference to the denudational processes.

4) See the mountain building activities through different theories.

Contents of the course:

Unit No.	Details	No. of Lectures/ Periods	No. of Credits
1	**Introduction to Geomorphology** 1.1 Meaning and Definition of Geomorphology 1.2 Nature and Scope of Geomorphology	**15**	**1**

	1.3 Development of Geomorphic Thoughts: ancient, medieval and modern period 1.4 Principles of Uniformitarianism, Contribution of Huttan, Gilbert, Dutton and Davis.		
2	**Interior of the Earth & Isostacy** 2.1 Constitution of Earth's Interior 2.2 The Theories of Isostacy- Pratt, Airy And Joly	**15**	**1**
3	**Geosynclines** 3.1 Geosynclinals theory of Kobber 3.2 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. Bloom A. L. (1991) Geom. 2 Ed Englewood Cliffs, M.J. Prentice.

2. Chistopherson R.W. (1995) Elematel ecosystem Prentice. Hall, N.J. Oqum (1985) Ecology, London.

3. Chorley, J.R. S.A. Schumm and DE Slogden (1984) Gcom. Methun, N.Y. London.

4. Christopherson, R.W. (1995) Elemental Geosystems: A Foundation in Physical Geography, Prentice Hall Englewood Cliffs, New Jersey.

5. Dayal P. (1996): A Textbook of Geomorpology, Shukla Book Depot, Patna.

6. Fairbridge, R.W. (ed): Eneyclopaedia of Geomorphology Reinhold, New York.

Thurman, H.V. (1994): introductory Oceanography 7th Ed. Mac Millan Pub. Co. New York.

8. Whittone, J. (1994) Dictionary of Physical Geogaphy, Penguin Books.

9. Spark B. W.: An Introduction to Geomorphology, Longman, London.

10. Spark B.W.: Geomorphology, Longman, London.

11. Savinder Singh (1998) Geomorphology, Prayag Pustak Bhavan, Allahabad.

12. Morgan R.S. & Wooldridge S.W. (1959) L Outline of Geomorphology the Physical basis of Geography, Longmans Green, London.

13. Worcester P. G. (1948): Textbook of Geomorphology, Princeton, D.van, Nortrand.

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Structure of Syllabus (NEP 2020)

For M. A. / M. Sc. Part- I Semester –I

Name of the Paper: Principal of Climatology

Paper Code: DSC - 2 **Total Lectures- 60**

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

Preamble:

Climatology is the typically provide an introduction to the research topic and set the context for the study. They may include the following elements: A brief overview of the current understanding of the subject matter, previous research, and key concepts related to the climatology topic being investigated. Clearly defining the research question or objective that the paper aims to address. This helps readers understand the purpose of the study. Explaining the importance of the study in the broader context of climatology and how it contributes to existing knowledge or addresses gaps in the field. An outline of the research methods and approaches used to collect data, analyze information, and draw conclusions. Defining the boundaries of the study, including what aspects are included and excluded, as well as potential constraints or limitations in the research.

Objective:

1) A concise statement of the specific goals and aims of the research, outlining what the paper intends to achieve or investigate.

2) Conduct research and provide in-depth analysis on a specific aspect of climatology.

3) This may involve exploring climate patterns, examining the effects of climate change, evaluating climate models, or investigating the impact of climate on various regions or ecosystems.

4) The paper aims to contribute new insights, findings, or solutions to the field of climatology and should be supported by credible data, evidence, and scientific methodologies.

Learning Outcomes:

1) Climatology learning outcomes typically include understanding atmospheric processes, climate patterns, and variability, analyzing climate data, and predicting climate changes.

2) Students may also learn about climate models, global climate systems, and the impacts of climate change on ecosystems and human society.

3) Additionally, they may develop skills in climate research, data interpretation, and climate policy analysis.

Contents of the course:

Unit No	Details	Lectures/ Periods	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	10	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	20	1

References:

1. Byrs R.H. : “General Meteorology”, Magraw Hill BK Co. New York.1974.
2. Pellersons: “Intoductionto Meteorology” Mc Gray Hill BK Co. NewYork.1969.
3. Richi H. : “intoruduction to Atmosphere” Mc Gray Hill BK Co. New York.1972.
4. Sellers W.D. : “Physical Climatology” University of Chicago Press. 1965.
5. Trewartha G.T. : An Introduction to climate “McGraw Hill BK Co. New York. 1968.

6. Das P. K. : The Mansoon, PrayagPustakBhawan, Allahabad.
7. ShastriRama: Weather & Weather forecasting, Ministry of Information NBT Dehli.
8. Lal D. S.: Climatology, PrayagPustakBhawan, Allhabad.
9. Ramashatri: Weather & Weather forecasting, Ministry of Information & Broadcasting.
10. Savindra Sing (2000): Climatology, PrayagPustakBhawan, Allahabad.
11. Mather J.R. (1975): Climatology: Fundamental & Applications. Mc Gray Hills Book Co. New York.
12. Hobbs J.E. (1980): Applied Climatology, Butterworth, London.
13. Crist Field: Principles of Climatology, Prentice Hall, London.
14. Oliver J.E. (1973): Climatic & Mans Environment, John Wiley & Sons, New York.

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Structure of Syllabus (NEP 2020)

For M. A. / M. Sc. Part- I Semester –I

Name of the Paper: Human Geography

PaperCode: DSE- 1.1 **Total Lectures- 60**

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

Objectives:

1) To acquaint the students with the nature, scope of human geography and races andreligions.

2) To identify and understand environment and population in terms of their growth and spatial distributional pattern.

3) To acquaint the students with the human settlements & human development.

Learning Outcomes:

1)Students will understand the various characteristics of human geography like races, religion, settlement and agriculture.

Contents of the course:

Unit No.	Details	Lectures/ Periods	No of credit
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	15	1

	Distribution of World Population 3.3 Population composition – Age and sex 3.4 Theories of Population- Malthus and Demographic Transition Theory		
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

Reference Books

1. Chandana R. C. (2010): Population Geography, Kalyani, Dehli
2. Hassan M. I. (2005): Population Geography, Rawat publicationJaipur
3. Danial P. A. & Hopkinson M. F. (1989): The Geography of Settlement, Oliver & Boyd,London.
4. Johanston R.: Gregory D. Pratt G. et al. (2008): The Dictionary of Human Geography, BlackwellPublication
5. Hussain Majid (2012): Human Geography, Rawat publication Jaipur

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Structure of Syllabus (NEP 2020)

For M. A. / M. Sc. Part- I Semester –I

Name of the Paper: Economic Geography

PaperCode: DSE - 1.2 **Total Lectures- 60**

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

Objectives:

1) To integrate the various factors of economic development.

2) To acquaint the students with dynamic aspects of economic geography.

Learning Outcomes:

1)To Student will annotating the fundamental concepts of Economic Geography.

2) To Student will criticizing the Industrial Location Theories by Weber and Losch.

3) To Student will understand the energy resources and energy crisis.

4) To Student will Appraising modes of transportation and trade.

Contents of the course:

Unit No.	Details	Lectures/ Periods	No. of Credit
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	15	1

	3.4 Energy Crisis		
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) Alexander J.W.: (1976): Economic Geography, Prentice Hall of India, New Delhi.

2) Alcxandersson G. (1988): Geography of manufacturing. Prentice Hall of India.

3) Berry, Conkling & Ray (1988): Economic Geography Prentice Hall of India, New Delhi.

4) Hurst Ellion (1986): Geography of Economic Behavior, Unwin, London.

5) Johnson R. J. & Taylor D.J. (1989): A world in crisis. Basil-Blackwell, Oxford.

6) Losch: (1954): Economics of Location. Yale University, NewYork.

7) Redeliff M (1987): Development of & the environmental crisis, Methuen, London.

8) Sinha B.N. (1971): Industrial Geography of India.

9) Watts H.D. (1987): Industrial Geography, Longman Scientific & Technical NewYork.

10) Haggett, Peter: Modern Synthesis in Geography.

11) Robinson H & Bamford C. G. (1978): Geography of Transport, Macdonald & Evans USA.

12) Misra R. P.: Regional Planning, Concepts, New Dehli.

13) Jones & Darkenwald: Economic Geography.

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Structure of Syllabus (NEP 2020)

For M. A. / M. Sc. PART - I SEMESTER - I

Name of the Paper - Research Methodology in Geography

Paper code: RM **Total Lectures: 60**

Course Credit: 4 **Total Marks: 100**

Objectives:

1) To understand the concept of Research Methodology in Geography

2) To acquaint the students with the Scientific Methods in research

3) To familiarize the students with the Formulation of Research Problem and Process of Research.

4) To explain the methodology of research Report Writing.

Learning Outcomes:

1) Remember the definition and research methodology

2) Understand the Research Problem and Sampling Design

3) Apply the knowledge of research in Collection and Analysis of Geographical Data

4) Explain the techniques of report writing

Contents of the course

UNIT	Details	NO. OF CONTACT HOURS	Credit
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	15	1

	Involved in Defining a Problem 2.3. Sampling: Meaning and importance 2.4 Types of sampling		
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** 1.1 Introduction- study area & objectives 1.2 Data and methodology 1.3 Data analysis, result, conclusion 4.4 Referencing system, bibliography and Plagiarism	15	1

References:

1) Research Methods - Ram Ahuja, Rawat Publications

2) Philosophy of Science–Mario Bunge, Transaction Publishers

3) Research Methodology-Methods and Techniques, C. R. Kothari New Age

4) Fundamentals of Statistics - Goon, Gupta and Das Gupt

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Structure of Syllabus (NEP 2020)

For M. A. / M. Sc. Part- I Semester –I

Name of the Paper: Representation of Landform and Topographical Map

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

Corse Credit: 2 **Total Marks- 50**

Objectives:

1) To familiarizes the students the identification of different Landforms on the Topographical Maps.

Learning Outcomes: After completing the course, students will be able to

1) Know the methods of representation of relief.

2) Understanding the topographical maps.

Contents of the course:

Unit No.	Details	No. of Lectures/ Periods	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. Davis, Peter. (1974) Science in Geography Data Description and presentation, Vol.3, Oxford University Press, London.

2. Hanwell, J.D. and Newson, M.D. (1973) Macmillan Education Ltd, London.

3. Mishra, R.P. (1973): Elements of Cartography, Prasaranga, University of Mysore.

4. Monkhouse, F.JR and Wilkinson, H.R. Maps and Diagrams, Mathwn and Company, London.

5. Robinson, A.H. and Sale R.D.: Elements of Cartography. Johns House and Sons, London.

6. Sing R. L. (1996): Map Work and Practical Geography, Central Book Dept. Allahabad.

7. Singh & Kannuja (1973): Map Work and Practical Geography, Central Book Dept. Allahabad.

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Structure of Syllabus (NEP 2020)

For M. A. / M. Sc. Part- I Semester –I

Name of the Paper: Study of Weather Maps

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

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

Preamble:

A weather map involves understanding the key elements and symbols used to represent weather data on the map. This includes learning about the different types of lines, colors, and symbols used to indicate various atmospheric conditions. By familiarizing oneself with the preamble, one can gain insight into how to interpret the map and extract meaningful information about temperature, pressure, wind direction and speed, humidity, and precipitation patterns. Understanding the preamble is essential for effectively reading and analyzing weather maps, as it lays the foundation for interpreting the data presented on the map and making informed weather forecasts.

Objectives:

1) Studying a weather map is to analyze and understand various atmospheric conditions, such as temperature, pressure, humidity, wind patterns, and precipitation.

2) This information helps meteorologists and weather forecasters make accurate predictions and provide valuable insights about current and future weather conditions in a specific region or globally.

3) By interpreting weather maps, scientists can identify weather systems, patterns, and potential severe weather events, ultimately aiding in better planning and preparedness for various weather-related impacts.

Learning Outcomes:

1) Students will develop the interpretation skills.

2) Students analyzing the weather patterns recognition.

3) Students understanding the forecasting skills.

4) Learners will become aware of various weather phenomena and their impacts, such as hurricanes, thunderstorms, and cold fronts, by studying their representations on weather maps.

5) Interpreting complex weather data requires critical thinking and analytical skills. Students will develop these abilities as they analyze the data presented on weather maps.

Contents of the course:

Unit No	Details	Lectures/ Periods	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. Ashis Sarakar: Practical Geography A Systematic approach, Orient Longman Ltd. Kolkatta.

2. Critchifield: Principles of Climatology.

3. Lawrence, G.R.P.: Cartographic methods, Mathur Co. London.

4. Mather J.R. (1974) Climatology, Fundamental & applications. McGraw Hill Book Co. New York.

5. Monkhouse, F.J.R.: Maps & Diagrams, Wilkinson, H.R. Methuen and Co. London.

6. R. L. Singh & Rana P.B. Singh: Element of Practical Geography, Kalyani Pub. New Delhi. (1999)

7. Trewartha G.T.: An Introduction to climate McGraw – Hill Book Co., New Delhi

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Structure of Syllabus (NEP 2020)

For M. A. / M. Sc. Part- I Semester –I

Name of the Paper: Analysis of Socio-Economic Data-1

PaperCode: DSE-1.1 (P) **Total Practical- 60**

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

Objectives:

1) For understanding various techniques of analysis of Socio-Economic Data.

2) To understating the skill of Socio-Economic Data.

Learning Outcomes: After completing the course, students will be able to

1) Know the analysis methods of socio-economic data.

2) Understanding the various diagram.

Contents of the course:

UnitNo.	Details	Lectures/Periods	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, UniversityMysore.

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.

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

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

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Structure of Syllabus (NEP 2020)

For M.A./M.Sc. Part- I Semester –I

Name of the Paper: Representation of Socio-Economic Data

PaperCode: DSE -1.2 (P) **Total Practical- 60**

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

Objectives:

1) To understanding various techniques of Representation of Socio- Economic Data.

2) To understating the skills of Socio-Economic Data.

Learning Outcomes: After completing the course, students will be able to

1) Know the analysis methods of socio-economic data.

2) Understanding the various diagram.

Contents of the course:

Unit No.	Details	Lectures / Periods	No. of credit
1	**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) 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.

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

6) Singh R. L.: Elements of PracticalGeography.

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Structure of Syllabus (NEP 2020)

For M. A. / M. Sc. Part I Semester II

Name of the Paper: Applied Geomorphology

Paper Code: DSC -3 **Total Lectures: 60**

Course Credits: 04 **Total Marks- 100**

Preamble:

The Geography students of M.A. /M.Sc. Part-I can better understand all latest concepts in Geomorphology in brief but in adequate manner. Geomorphology part of this courses deals with the study of evolution of continents and ocean basins. In this subject also included the formation of ocean and land from single supercontinents of Pangea, also studied the movement of plates through the plate tectonics theory. Concept of Cycle of erosion, Dynamic agencies of denudation Process, Landforms associated Slope development, and applied Geomorphology and recent trends in Geomorphology.

Objectives:

1) To acquaint the students with the theories of evolution of continents and Ocean basins.

2) To study the students with certain fundamental geomorphological concepts, Cycle of Erosion, Slope development, Denudation and land forming processes.

3) To introduce the applied Geomorphology and recent trends in Geomorphology.

Learning Outcomes: The students will be able to

1) The course will provide an understanding of the conceptual and dynamic aspects of landform development.

2) Students will also learn the relevance of applied aspects of Geomorphology in various fields.

3) Students became aware of earth movements, geomorphic process and evolution of landforms.

Contents of the course:

Unit No.	Details	Lectures/ Periods	Credit
1	**Origin of Continents and Ocean Basins** 1.1 Evolution of Continents and Ocean basins 1.2 Alfred Wegener's Continental Drift Theory	15	1

	1.3 Plate Tectonics Theory		
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) Bloom A.L. 1991 Geom. 2nd Ed. Englewood Cliffs, M. J. prentice.

2) Chistopherson R.W. 1995: Elements ecosystem Prentice Hall. N.J.

3) Chorley, J.R. S.A. Sehumm & DE Slogden 1984 Geom. Methuen. N.Y. London

4) Christopherson, R.W. 1995: Elemental Geosystems: A Foundation in Physical Geography, Prentice Hall Englewood Cliffs, New Jersey.

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6) Fairbridge R.W. 1968 (Ed): Eneyelopaedial of Geomorphology Reinhold, New York.

7) Garrison, T. 1994: Essential of Oceanography, New York, Wadsworth Pub. Co. London.

8) Hamblin,W. K.1995.:Earth'sDynamicSystems7th ed. Preshre Hall, New York.

9) S. Singh 1999.: Physical Geography, Prayag Pustak Bhavan, Allahabad.

10) Strahier A. (1996) Physical Geography, Science & System of the Human Environment, New York, Hahu Wiley.

11) Starahier, A & A Strahler 1992 Physical Geography, John Wiley & Sons. New York.

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For M. A. / M. Sc. Part I Semester II

Name of the Paper: Applied Climatology

Paper Code: DSC-4 **Total Lectures: 60**

Course Credits: 04 **Total Marks- 100**

Preamble:

The geography students of M. A. / M. Sc. Part-I can better understand all concepts in climatology in brief. Climatology is the part of these courses deals with the study of Earth surrounding area and origin of the winds. In this subject also included the formation of atmosphere and the components of atmosphere including gases. In this course also studied the formation and types of clouds.

Objectives:

1) The objective of this course is to introduce the basic concepts in climatology.

2) To study the students with certain fundamental climatologically concepts, urban climate and heat is land and climatic classification.

3) To introduce the major issues originated due to climate change.

4) To get the students familiar ozone layer depletion, Global Warming.

Learning Outcomes: The students will be able to

1) The course will provide an understanding of the conceptual and dynamic aspects of climatic classification.

2) Students will also learn the relevance of applied aspects of climatology in various fields.

3) Students became aware of air pollution, droughts, climate and health.

Contents of the course:

Unit No.	Details	Lectures / Periods	Credit
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	15	1

	2.2 Agro-climatic regions of India.		
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: "General Climatology" Printice Hall, London.

2) Mather J. R. (1974): "Climatology–Fundamental and Application" McGraw Hill Book Co. New York.

3) Oliver J. E. (1973): "Climate&Man'sEnvironment An Introduction Applied Climatology", John Wiley and Sons, New York.

4) Lutgens F. K. & Tarbuck, E. J. (5^{th} Ed.) The Atmosphere-An Introduction to meteorology, Printice Hall, New Jersey.

5) MillerG.T.(Jr.) (9^{th}Ed.): "Living the Environment" Wadsworth Publishing Co. New York.

6) Savinder Singh (1999): Physical Geography, Prayag Pustak Bhavan, Allahabad.

7) Mamoria C. B.: Agricultural Geography of India.

8) Hobbs J. E. (1980): Applied Climatology, Buttrworth, London.

9) CristField: Principles of Climatology. Printice Hall, London

10) Lal D.S.: Climatology Prayag Pustak Bhavan, Allahabad

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For M. A. / M. Sc. PART - I SEMESTER – II

Name of the Paper - Population Geography

Paper code: DSE- 2.1 **Total Lectures: 60**

Course Credit: 4 **Total Marks: 100**

Preamble:

The geography students of M. A. / M. Sc. Part-I can better understand all concepts in population geography in brief. Population geography is the part of these courses deals with the study of population in the world. In this subject also included the growth, distribution, fertility, mortality, migration. In this course also studied the Concept of optimum, over & under population, Malthus's theory of Population Growth, Growth of Population problems and Population policies like China and India

Objectives:

1) To understand the students with the nature, scope of population geography

2) To introduce sources of population data, population distribution and composition.

3) To acquaint the students with fertility and mortality, population growth theory, population and recourses.

4) To familiarize the students with various population problem

Outcome:

1) Recognize definition, nature scope and significance of population geography

2) Compare growth and distribution of population

3) Analyze the Population composition such as Age, sex and Occupational structure

4) Overcome population problems with policies

UNIT	Details	NO. Of Contact Hours	Credit
I	**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
II	**Growth and Distribution of Population** 2.1 Growth of population in world	15	

	2.2 Factor affecting on population distribution 2.3 Population distribution pattern in world 2.4 Population composition: Age and Sex		1
III	**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
IV	**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

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For M. A. / M. Sc. Part- I Semester –II

Name of the Paper: Geography of Health

Paper Code: DSE-2.2 **Total Lectures- 60**

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

Preamble:

The student of Geography of M.A. /M.Sc. Part I can batter understood health issues related to communicable and non-communicable diseases. This course deals with the study of geographical factors affecting on human health and diseases arising from them. In this subject also studied environmental degradation and urbanization with it's affected on human health as well as studied the nature, scope and significance of health Geography.

Objective:

1) To acquaint the students with the role of geographical factors, viz; Physical, demographic social & economic, influencing the spatial distribution of diseases:

2) To understand the student the relation of health with nutrition, environmental degradation & urbanization.

3) To make the students abreast of existing health care facilities, so as to train them with better health care planning for the country.

Learning Outcomes:

1) The course will be provide an understanding of occupational and deficiency diseases.

2) Students will also learn the different type of transmittable of major diseases and presentation.

3) Students will be achieving the knowledge about problems of mal-nutrition in India and its major causes with eradication process.

Contents of the course

Unit No	Details	No. Of Contact Hours	Credit
1	**Introduction to Geography of Health** 1.1 Meaning and Definition of Health geography 1.2 Nature of Health geography	15	1

	1.3 Scope of Health geography 1.4 Significance of geography of Health		
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.
14) Shanon, G.M. et. al: The Geography of AIDS, Guilford press, New York, 1987.
15) Smit, D: Human Geography – A welfare Approach, Arnold Heinemann, London 1997.
16) Sochin, A.A: Fundamentals of medical Geography Dept. of Army Tran, M.J. 5264, Washington D.C., 1968.
17) Stamp L.D.: The Geography of Life and Death, Cornell University, Iteaca, 1964
18) S. C. Sinha- Medical Geography, Rawat Publication, Jaipur
19) Ishtiaq A. Mayer- Medical Geography, Rawat Publication, Jaipur

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For M. A. / M. Sc. PART - I SEMESTER - II

Name of the Paper -Field Project in Geography

Paper code: FP **Total Lectures: 60**

Course Credit: 4 **Total Marks: 100**

Learning Objectives:

1) To explain the concept of field work

2) To introduce the students about field techniques and tools.

3) To introduce the students to design the field report

4) To Acquaint the student with writing of project report

Learning Outcomes:

1) Remember the Value, Data and Ethics role of Field Work

2) Understand the appropriate field Technique

3) Apply the knowledge of field survey in research

4) Design the field report

Contents of the course

UNIT	Details	No. Of Contact Hours	Credit
I	**Field Work** 1.1 Field Work–Role, Value, Data and Ethics, 1.2 Identifying the Case Study - Rural/Urban/Physical/Human/ Environmental	15	1
II	**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)	15	1

III	**Field Survey** 3.1 Collection of Material for Physical 3.2 Socio-Economic	15	1
IV	**Report Writing and viva - voce** 4.1 Introduction, Objectives, Sources of Data and Methodology, Analysis of data 4.2 Interpretation, Writing the Report	15	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 10days.

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 soft 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, NewDelhi.

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) Special Issue on "Doing Fieldwork" *The Geographical Review* 91:1-2(2001).

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

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For M. A. / M. Sc. Part I Semester II

Name of the Paper: Study of Landforms Analysis Techniques

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

Course Credits: 02 **Total Marks -50**

Preamble:

The geography students of M.A./M.Sc. Part-I can better understand all basic and latest concepts of cartography. Cartography is the part of these courses deals with the draw the various types landforms. In this subject also included the river profiles and slopes for the analysis of river channel. Slope determinant is another part also studied to draw various types of slope and it's measurement to using C.K. Wentworth and Smith's method.

Objectives:

1) To identify the different Drainage patterns and types of slopes

2) To get the students familiar with profiles, identification of landforms from Topographical Maps and river drainage pattern.

Learning Outcomes: The students will be able to

1) The course will provide an understanding difference between old and new techniques of cartography.

2) Students will also learn the various types of slopes and landforms.

3) Students became aware of river channel and counter lines from toposheets.

4) Student will identify drainage pattern and bifurcation ratio.

Contents of the course:

Unit No.	Details	Lectures/ Periods	Credit
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. Davis, Peter. (1974) Science in Geography Data Description & presentation, Vol.3, Oxford University Press, London.
2. Hanwell, J.D. & Newson, M.D. (1973) Macmillan Education Ltd, London.
3. Mishra, R.P. (1973): Elements of Cartography, Prasaranga, University of Mysore.
4. Monkhouse, F. JR & Wilkinson, H.R. Maps and Diagrams, Mathwn and Company, London.
5. Robinson, A.H. & Sale R.D.: Elements of Cartography. Johns House & Sons, London.
6. Sing R. L. (1996): Map Work and Practical Geography, Central Book Dept. Allahabad.
7. Singh & Kannujin (1973): Map Work and Practical Geography, Central Book Dept.

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For M. A. / M. Sc. Part I Semester II

Name of the Paper: Analysis of Climatic Data

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

Course Credits: 02 **Total Marks – 50**

Preamble:

The geography students of M.A./M.Sc. Part-I can better understand all basic graphical techniques using in climatic data variation. Climatic data is the part of these courses deals with the draw the various graphs and diagrams different stations related to weather and climatic conditions and interpretation with analyzing. In this subject properly mentioned moving average lines with trend lines and its data analysis. Otherwise somedispersion graphs very useful to show clear climatic data variables it indicates several topics about weather climatic in formation in statistical format odd and even data formula.

Objectives:

1) The objective of this course is to introduce the student with interpretation and construction of climatic graph and diagram.

2) To study the students different trend line graphical analysis with data tabulation.

3) To get the students' knowledge about draw the temperature and rainfall climatic dispersion graph

4) To get the students well knowing with correlation variables number splotting on the graph pages with typical formula calculation using in research sectors in various region.

Learning Outcomes: The students will be able to

1) The course will provide an understanding difference between correlation and dispersion graph pattern.

2) Students will also attain the knowledge get about semi–average line graph swith odd and even techniques.

3) Students became creative in field of calculation, tabulation, and digitalization in spatial climatic data with represent and interpretation.

4) Student will identify temperate zones, sub-tropical zone and monsoon seasonal zone help with weather maps.

Contents of the course:

UnitNo.	Title of the Unit	No. of Lecture	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 Hythergraph	30	1

ReferenceBooks:

1) Ashis Sarakar: Practical Geography A Systemati capproach, Orient Longman Ltd. Kolkatta.

2) Critchifield: Principles of Climatology.

3) Lawrence G.R.P.: Cartographic methods, Mathur Co. London.

4) Mather J. R. (1974) Climatology, Fundamental & applications. McGraw Hill Book Co. New York.

5) Monkhouse F.J.R.: Mapsand Diagrams, Wilkinson, H. R. Methuen and Co. London.

6) R. L. Singh and Rana P. B. Singh: Element of Practical Geography, Kalyani Pub. New Delhi (1999)

7) Trewartha G.T.: An Introduction to climate McGraw–Hill Book Co., New Delhi

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For M. A. / M. Sc. Part I Semester II

Name of the Paper - Practical in Population Geography

Paper code: DSE – 2.1 (P) **Total Lectures: 60**

Course Credit: 2 **Total Marks: 50**

Objectives:

1) To understand quantitative techniques in Population Geography

2) To introduce Methods of Representing and Mapping of Population Data

Learning Outcome:

1) Draw various types of pyramid.

2) Classify dot and choropleth method.

Contents of the course:

Unit No.	Details	Lectures/ Periods	Credits
1	**Unit I: 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, 2.2Choropleth Method 2.3 Flow line graph (population)	30	1

References:

1. Liendsor, J. M. (1997): Techniques in Human Geography, Routledge,London
2. Lloyd P. and Dicken, B. (1972): Location in Space: A TheoreticalApproach to Economic Geography, Harper and Row, NewYork
3. Wood, A. and Roberts, S. (2011): Economic Geography: Places, Networkand Flows, Routledge, London
4. Chorley, R. J. and Hagget, P. (1972) Socio-economic Models inGeography, Mathuen and Co.,London
5. Monkhouse, F. J. and Wilkinson, H. R. (1971): Maps and Diagrams,Methuen and London

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For M. A. / M. Sc. Part I Semester II

Name of the Paper –Analysis of Socio-Economic Data

Paper code: DSE – 2.2 (P) **Total Lectures: 60**

Course Credit: 2 **Total Marks: 50**

Preamble:-The student of Geography of M.A. /M.Sc. Part I can batter understood all basic and latest concept of socio economic phenomena this is a new technique including of analyzing to socio economic data. These course deal with the draw the several types of Pyramids, Graph and Diagram and its relevance to distribution maps Otherwise representation of socio – economic graphical analysis used in different technique and skills.

Objectives:

1. The objective of this course is to introduce the student with interpretation and construction of graph and diagram.
2. To study the students different pyramids analysis with data tabulation.
3. To get the students well knowing with correlation variables numbers plotting on the graph pages with typical formula calculation using in research sectors in various region. .

Learning Outcomes:

The students will be able to

1. The course will provide an understanding difference between various pyramids.
2. Students will also attain the knowledge about semi –average line graphs with odd and even techniques.
3. Students became creative in field of calculation, tabulation, and digitalization in spatial climatic data with represent and interpretation.
4. To understand the students various cartographic techniques of analysis of socio-economic data.

Contents of the course:

Unit No.	Details	Lectures/ Periods	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