

**Scheme and Syllabi for
M.Sc. Geography
(2 Year Degree Program)
For UTD and Affiliated Colleges
w.e.f 2024-25**



**University with Potential for Excellence
(Accredited by NAAC A+ Grade)
Category Graded Autonomy by UGC**

**Department of Geography
Guru Jambheshwar University of Science & Technology
Hisar-125001 (Haryana)**

DEPARTMENT OF GEOGRAPHY

M.Sc. Geography

(2 Year Degree Program)

For UTD and Affiliated Colleges

w.e.f 2024-25

Scheme of Course

Name of the Programme: M.Sc. Geography

(CURRICULUM AND CREDIT FRAMEWORK FOR PG PROGRAMMES) by UGC as per NEP 2020

Duration of the Programme : Two Years (Four Semesters)

About Us

Department of Geography started in 2023 at undergraduate level and subsequently related to postgraduate level in 2024. At present the department is running two programmes of M.Sc Geography & Integrated B.sc-(Hons./Hons.with Research)-M.sc Geography. These courses in geography prepare the students for pursuing career in academics, teaching, urban and Regional planning, applications of Remote Sensing and Geographical Information Systems, Cartography, Surveying, Town and Country Planning, Disaster Management, Aerial Photography, Satellite imaging and other public services. The department has started GIS and Computer Cartography Laboratory to facilitate studies involving remote sensing techniques, GIS software, digital processing of imageries and statistical programmes for processing socio-economic data.

DEPARTMENT- VISION AND MISSION

VISION

to become a model department as a Centre of quality education, research with innovation and recognition at National and International level for serving the society.

MISSION

- M1: To provide quality education to aspiring young minds for improving their skills, inculcating values, creating leadership qualities and enhance research with innovative methods.
- M2: To produce young geographers who would contribute in the areas of higher education, regional and national planning, development, environment, ethics and sustainable development.
- M3: To develop Teaching-Learning methods which can produce socially committed professionals who contribute effectively in nation building

Course Objectives

- To be able to explain territorial diversity and complexity and the interrelations of natural environmental phenomena with economic, social and cultural phenomena.
- To ensure that students are able to act and take part in the management of territory by drawing on their training in geography.
- Specifies a behavior, skill, or action that a student can demonstrate if they have achieved mastery of the objective.
- To help you understand how geographers think about the world, consider geography's five themes-location, place, region, movement and human-environment interaction.
- To ensure a general grounding of the fundamental knowledge of geography, its epistemological development and its research methods.
- To ensure that students are able to put theoretical, methodological and instrumental knowledge into practice, make comprehensive analyses, interpret spatial problems and processes and make territorial diagnoses.
- To ensure that students are able to act and take part in the management of territory by drawing on their training in geography.
- To develop the specific skills related to work techniques, particularly those related to analysis, process and representation of geographical information and field work.
- To ensure that the necessary knowledge to teach geography at secondary school level is given in accordance with the current legislation.
- To enable graduates to take postgraduate or specialization courses in which a territorial component is dealt with.
- To be able to explain territorial diversity and complexity and the interrelations of natural environmental phenomena with economic, social and cultural phenomena.

DEPARTMENT OF GEOGRAPHY

Scheme and Instruction for M.Sc. Geography Two year Programme For UTD and Affiliated Colleges w.e.f 2024-25

The M.Sc. Geography Two year Programme is a postgraduate course designed in accordance with the provisions of the CURRICULUM AND CREDIT FRAMEWORK FOR PG PROGRAMMES” by UGC.

The course curriculum is structured to reflect the University’s belief that multi-disciplinary thinking is the key to develop comprehensive understanding.

The course M.Sc. Geography Two year Programme under the CURRICULUM AND CREDIT FRAMEWORK FOR PG PROGRAMMES” offers multiple entries and exist options for the students pursuing the course. The award diploma and degree to the students pursuing M.sc Geography - will be as mentioned below:

Year	Type of Diploma/Degree	Qualification title/nomenclature and programme duration
1st Year	P.G Diploma	P.G Diploma in Geography
2nd Year	Master’s degree	Master of Science in Geography.

Note: In case of any confusion or conflict with the rules and regulation of the university, the rules and regulation of the university shall prevail and decision of the Vice Chancellor will be final.

The M.Sc. Geography programme is divided into four semesters (two semesters in first year, two semesters in the second year .Every semester ordinarily shall be of 21 weeks of duration inclusive of teaching and examination. The 04 credits shall be equivalent to 100 marks which shall be classified into the ratio of 70% external and 30% internal. The division of marks is as under:

Suggested Evaluation Methods	
Internal Assessment : 20/30 Marks ➤ Theory <ul style="list-style-type: none"> • Class Participation : 05 Marks • Seminar / presentation / assignment / quiz etc. : 05 Marks • Mid-Term Exam : 10 Marks • Assignment : 10 Marks 	End-Term Examination 50/70 Marks
➤ For Practical – 10/30 Marks <ul style="list-style-type: none"> • Class Participation : 05 Marks • Seminar / Demonstration / Viva-Voce/Lab records etc. : 15 Marks • Mid-Term Exam : 10 Marks 	20/70 Marks

The Internal Assessment awarded to a student in any particular course will be based on performance of the students in minor tests, Attendance and Co-curricular Activities (Assessment, Vivo-Voce, Presentation, Live assignment, Subject Quiz, Group Discussion, Case Study, etc.)

The students who fail in internal assessment as well as in aggregate will have the option to improve their score in the internal assessment giving a special chance to such students. However, no student will be allowed to improve his/her score of internal assessment, if he/she has already scored 40% marks in aggregate as well in external examination. A student who could not secure 40% marks in external will have to reappear in the external examination of the respective paper as per university rules.

Instructions to the examiners and students for the End term exams:

- The following instructions are related to the papers having four credits i.e. 70 marks of theory and 30 marks of internal assessment. The examiner is required to set nine questions in all. The first question will be compulsory consisting of seven short questions covering the entire syllabus. In addition, eight more questions will be set comprising two questions from each unit. The students shall be required to attempt five questions in all selecting one question from each unit in addition to the compulsory Question No. 1. All questions shall carry equal marks. The maximum time allotted for the major test is 03 (three) hours. – **70 Marks**
- The following instructions are related to the papers having four credits i.e. 50 marks of theory and 20 marks of internal assessment with 30 marks of practical exam. The examiner is required to set nine questions in all. The first question will be compulsory consisting of five short questions covering the entire syllabus. In addition, eight more questions will be set comprising two questions from each unit. The students shall be required to attempt five questions in all selecting one question from each unit in addition to the compulsory Question No. 1. All questions shall carry equal marks. The maximum time allotted for the major test is 2.5 (two and half) hours. – **50 Marks**
- The following instructions are related to the papers having two credits i.e. 35 marks of theory and 15 marks of internal assessment. The examiner is requested to set five questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of five short answer type questions each of three marks). The candidate is required to attempt two questions in all selecting one from each unit carry ten marks and the compulsory Question No.1. The maximum time allotted for the major test is 2 (two) hours - **35 Marks**



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('A+' NAAC Accredited State Govt. University)



Scheme of Examination for M.SC Geography
For UTD and Affiliated Colleges

Duration of the Programme: (Two Years Programme)

CURRICULUM AND CREDIT FRAMEWORK FOR PG PROGRAMMES
Of National Education Policy-2020

FIRST YEAR

SEMESTER-I

Type of Course	Course Code	Nomenclature of Paper/Course	Credits	Contact Hours	Internal Marks	External Marks	Total Marks	Duration of Exam (Hrs)
Discipline Specific Course	P24GEO101T	Evolution of Geographical Thought	4	4	30	70	100	3
	P24GEO102T	Geomorphology	4	4	30	70	100	3
	P24GEO103T	Agricultural Geography	4	4	30	70	100	3
	P24GEO104T	Statistical Methods in Geography (T)	3	3	20	50	70	2.5
	P24GEO104P	Statistical Methods in Geography (P)	1	2	10	20	30	2
	P24GEO105T	Fundamentals of Remote-sensing (T)	2	2	15	35	50	2
	P24GEO105P	Fundamentals of Remote-sensing (P)	2	4	15	35	50	2
	P24GEO106T OR P24GEO107S	Sustainable Development OR Seminar	2	2 2	15 00	35 50	50	2 2
	P24GEO108T OR P24GEO109T	Social Geography OR Oceanography	2	2 2	15	35	50	2 2
				24	27+4*	165/180	435/420	600

***Additional Contact Hours as per optional subjects opted by the students.**

SEMESTER-II								
Type of Course	Course Code	Nomenclature of Paper/Course	Credits	Contact Hours	Internal Marks	External Marks	Total Marks	Duration of Exam (Hrs)
Discipline Specific Course	P24GEO201T	Research Methodology (T)	3	3	20	50	70	2.5
	P24GEO201P	Research Methodology (P)	1	2	10	20	30	2
	P24GEO202T	Geography of India	4	4	30	70	100	3
	P24GEO203T	Regional Development and Planning	4	4	30	70	100	3
	P24GEO204T	OR Political Geography		4	30	70	100	3
	P24GEO205T	Fundamentals of GIS and GNSS Technology (T)	2	2	15	35	50	2
	P24GEO205P	Fundamentals of GIS and GNSS Technology (P)	2	4	15	35	50	2
	M24INT206I	INTERNSHIP*	4		50	50	100	
			20	15+8*	200	400	600	

*Additional Contact Hours as per optional subjects opted by the students.

After Completion of First year the students will be awarded as Post-Graduate Diploma in Geography.

*An Internship course of 4-6 weeks duration during summer vacation after second semester is to be completed by every student. Internship can be either for enhancing the employability or for developing the research aptitude.



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CURRICULUM AND CREDIT FRAMEWORK FOR PG PROGRAMMES
Of National Education Policy-2020

SECOND YEAR

SEMESTER-III								
Type of Course	Course Code	Nomenclature of Paper/Course	Credits	Contact Hours	Internal Marks	External Marks	Total Marks	Duration of Exam (Hrs)
Discipline Specific Course	P24GEO301T	Climatology	4	4	30	70	100	3
	P24GEO302T	Urban Geography	4	4	30	70	100	3
	P24GEO303T	Economic Geography	4	4	30	70	100	3
	P24GEO304T OR P24GEO305T	Electoral Geography OR Disaster Management	4	4	30	70	100	3
	P24GEO306P	Cartographic Techniques and Morphometric Analysis (P)	4	8	30	70	100	3
			20	20+8*	150	350	500	

*Additional Contact Hours as per optional subjects opted by the students

SEMESTER-IV

Type of Course	Course Code	Nomenclature of Paper/Course	Credits	Contact Hours	Internal Marks	External Marks	Total Marks	Duration of Exam (Hrs)
Discipline Specific Course	P24GEO401T	Ecosystem and Environment	4	4	30	70	100	3
	P24GEO402T	Population Geography	4	4	30	70	100	3
	OR P24GEO403T	OR Town and Country Planning		4				3
Research (Dissertation/ Project Report/ Academic Report Exemption for those students who have completed their U.G with Research)	P24GEO404D	Dissertation/ Project Report/ Academic Report	12	0	100	200	300	0
	OR							
	P24GEO405T	Geography of India (systematic and Regional)	4	4	30	70	100	3
	P24GEO406T	Applied Climatology	4	4	30	70	100	3
	P24GEO407T	Geography of Migration	4	4	30	70	100	3
			20	16+8*	60/150	440/350	500	

***Additional Contact Hours as per optional subjects opted by the students**

M.Sc. Geography
First Semester
Evolution of Geographical Thought

Course code: P24GEO101T
60 Hrs (4 Hrs /week)
Credits: 4
Time: 3 Hrs

Marks for External: 70
Marks for Internal Exam: 30
Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: Main objectives of this course are to acquaint the students with the philosophy, methodology and historical development of geography as a professional field. The idea is to address the spirit and purpose of the changing geographies and to what we as geographers contribute towards knowledge production. The course aims at developing critical thinking and analytical approaches

UNIT- I

1. Basic Frame and Concepts. Man-environment interaction: Newenvironmentalism; Gaia Theory
2. School of Geography- Greek, Roman and Arab Geographers
3. Modern Approaches: Quantitative revolution and challenges

UNIT- II

4. School of Geography- American, German and British Geographers
5. Philosophy and geography: Contributions of Vidal de la Blache, Carl Sauer other FrenchGeographers,
6. Humanistic and phenomenological geography: contributions of Yi-Fu Tuan

UNIT -III

7. Contemporary Trends. Qualitative paradigm; Behavioral revolution: mentalmaps;
8. Marxism and Postmodernism in Geography
9. Indian Geography: Base and Trends. Post colonialism and Indian geography. Future of Indian geography: problems,perspectives andprospects.

UNIT- IV

10. Impact of Darwinian theory in Geographical Thought
11. Concepts: space, place, time and spatial organization
12. Contemporary Development :- Positivism, Radicalism, Feminism

Books Recommended

1. Adams, P., Steven, H. and Karel, T. (eds.) (2001): *Texture of Place. Exploring Humanistic Geographies*. University of Minnesota Press, Minneapolis.
2. Anderson, K., Domosh, M., Pile, S. and Thrift, N. (eds.) (2003): *Handbook of Cultural Geography*. Sage Publications, London.
3. Barnes, T. and Gregory, D. (eds.) (1997): *Readings in Human Geography: The Poetics and Politics of Inquiry*. Arnold, London.
4. Bunkše, E. V. (2004): *Geography and the Art of Life*. John Hopkins University Press, Baltimore.
5. Buttimer, A. (1971): *Society and Milieu in the French Geographic Tradition*. Rand McNally, Chicago.
6. Daniels, P., Bradshaw, M., Shaw, D. and Sidaway, J. (2000): *An Introduction to Human Geography. Issues for the 21st Century*. Prentice Hall, London.
7. Dear, M. J. and Flusty, S. (2002): *The Spaces of Postmodernity: Readings in Human Geography*. Blackwell Publishers, Oxford.
8. Dikshit, R. D. (2004): *Geographical Thought. A Critical History of Ideas*. Prentice-Hall of India, New Delhi. (in English and Hindi).
9. Doel, M. (1999): *Poststructuralist Geographies. The Diabolical Art of Spatial Science*. Edinburgh University Press, Edinburgh
10. Gaile, G. and Wilmott, C. (eds.) (2003): *Geography in America at the Dawn of the 21st Century*. Oxford University Press, Oxford and New York.
11. Harvey, D. (1969): *Explanation in Geography*. Arnold, London.
12. Harvey, M. E. and Holly, P.B. (2002): *Themes in Geographic Thought*. Rawat Publications, Jaipur and New Delhi.
13. Hubbard, P., Kitchin, R., Bartley, B. and Fuller, D. (2002): *Thinking Geographically: Space, Theory and Contemporary Human Geography*. Continuum, London.
14. Johnston, R., Gregor, D., Pratt, G, Watts, M. and Whatmore, S. (2003): *The Dictionary of Human Geography*. Blackwell Publishers, Oxford. 5th edition.
15. Johnston, R.J. (1985): *The Future of Geography*, Methuen and Company Ltd., New York. (2003 edition published).
16. Johnston, R.J. and Sidaway, J.D. (2004): *Geography and Geographers*. 6th edition, Edward Arnold, London.
17. Kapur, A. (ed.) (2001): *Indian Geography – Voice of Concern*. Concept Publishing Company, New Delhi.
18. *All Possible Words* – P. James

Course outcomes

At the end of the course, the students would be able to:

- : Cognizance of nature and philosophy of geography.
- : Contextualization of development of geographic knowledge in ancient and medieval period.
- : Awareness about philosophy and concepts of modern geography.
- : Acquaintance with positivist and alternative explanations in geography.

M.Sc. Geography
First Semester
Geomorphology

Course code: P24GEO102T
60 Hrs (4 Hrs /week)
Credits: 4
Time: 3 Hrs

Marks for External: 70
Marks for Internal Exam: 30
Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: This paper deals with fundamentals and properties of physical features of earth.

Unit-I

1. Introduction to geomorphology as a science: definition, nature, scope and recent developments.
2. Fundamental concepts: geological structure and landforms, uniformitarian's, multi-cycle and polygenetic
3. Evolution of landscape, frequency concept of geomorphic processes, Climatogenetic geomorphology.

Unit-II

4. Continental drift theory and its basic considerations; Plate tectonics-meaning and concept, margins and boundaries, plate motion and cycle; Tectonic activities along boundaries and distribution of plates.
5. Hill slope-definition and forms of slope, geomorphic processes and slope forms, theories of slope evolution by Davis, Penck and King

Unit-III

6. Weathering: Causes; types of weathering: physical, chemical and biological. Mass movement, causes, classifications and types of mass movements- slow and rapid mass movements.
7. Mountain building and Earth Movements

Unit-IV

8. Geomorphic processes and resulting land forms: Fluvial, Glacial, Periglacial
9. Geomorphic processes and resulting land forms: Aeolian, Karst and Coastal Landforms
10. Applied geomorphology: meaning and concept, role of geomorphology in environmental management of the following: (i) accelerated erosion and sedimentation, (ii) construction of large dams (iii) urban floods.
11. Vulcanicity and Landforms

Books Suggested:

1. Bloom AL. 2002. Geomorphology: A systematic Analysis of late Cenozoic landforms. Prentice-Hall Private Limited, New Delhi.
2. Embleton, C and Thornmne. J. 1979. Process in Geomorphology. London, Edward Arnold.
3. Kale VS and Gupta A. 2001. Introduction to Geomorphology. Orient Longman, Hyderabad.
4. Ritter DF., Kochel RC. and Miller JR. 1995. Process Geomorphology. Dubuque, WinC. Brown Publishers.
5. Sharma HS and Kale VS 2009. Geomorphology in India, Prayag Pustak Bhawan, Allahabad.
6. Sharma, VK. 2010. Introduction to Process Geomorphology. Taylor and Francis's, London.
7. Sharma, VK. 1992. Earth's Surface Processes and Forms. Tata McGraw Hill Publications, New Delhi.
8. Singh S. 2002. Geomorphology, Prayag Pustak Bhawan, Allahabad.
9. Strahler AH. 2013. Introducing Physical Geography, Wiley and Sons, New York.
10. Thornbury, WD. 2004. Principles of Geomorphology, John Wiley Sons, New York.

Course outcomes:

At the end of the course, the students would be able to:

- : Development of understanding about the fundamental concepts of geomorphology.
- : Enrichment of knowledge about tectonic activities and hill slope relationship.
- : Familiarization with the processes and patterns shaping the landforms.
- : Understanding of environmental management using principles of applied geomorphology

M.Sc. Geography
First Semester
Agricultural Geography

Course code: P24GEO103T

60 Hrs (4 Hrs /week)

Credits: 4

Time: 3 Hrs

Marks for External: 70

Marks for Internal Exam: 30

Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: The course should fully acquaint the students with the understanding of agricultural geography as enveloped branch of geography.

UNIT-I

1. Nature, scope and significance of agricultural geography.
2. Origin and dispersal of agriculture in the World.
3. Determinants of agricultural patterns: physical, technological and cultural factors

UNIT-II

4. Concepts of land capability survey, land use and cropping pattern.
5. Agricultural Concepts: intensity of cropping, Degree of commercialization, Cropping diversification and concentration, Crop combination, Contract framing and agri-business.
6. Approaches in agricultural regionalization: Von Thunen Model of agricultural land use, Agro-climatic zonation: Concept and Indian experience.

UNIT-III

7. Bases of identification of agricultural systems by Whittlesey and agricultural typology by Kostrowiki.
8. Measurements of agricultural efficiency and productivity.
9. Nature, significance and classification of agricultural models; economic and descriptive models; food security; sustainable agriculture; WTO and Agriculture.
10. Green revolution: Its impacts and consequences in India.

UNIT-IV

11. Food production and security in India.
12. Neo-liberalization and Indian agriculture.
13. Agriculture and climate change: impacts and adaptation.
14. Agriculture Policies after independence in India

Suggested Readings:

1. Bowler TR (1992) the Geography of Agriculture in Developed Market Economics. Longman.
2. Geoffrey, H.F.(1970) Geography of Agriculture: Themes in Research. Practice Hall, N.J.
3. Grigg D (1995) Introduction to Agricultural Geography. Routledge, London.
4. Husain, Majid (1996) Systematic Agricultural Geography. Rawat Publications, Jaipur.
5. Morgon, W.B. and Munton, R.J.C.(1971) Agricultural Geography. Methuen, London.
6. Singh Jasbir and Dhillon S.S. (1994) Agricultural Geography. Tata Mc Graw Hill, New Delhi.
7. Safi, Mohammad (2007) Agricultural Geography. Prentice-Hall of India.
8. Singh Jasbir (1989) Agricultural Geography.
9. Symons, Leslic (1967): Agricultural Geography, G. Bell and Sons, London.

Course outcomes:

At the end of the course, the students would be able to:

- : Enrichment of knowledge about origin, location and distribution of agricultural activities.
- : Enhancement of knowledge about changing land use and cropping pattern.
- : Acquaintance with agricultural systems, efficiency and productivity.
- : Awareness about impacts of climate change and economic liberalization on agriculture.

M.Sc. Geography
First Semester
Statistical Methods in Geography (T)

Course code: P24GEO104T

45 Hrs (3 Hrs /week)

Credits: 3

Time: 2.5 Hrs

Marks for External: 50

Marks for Internal Exam: 20

Total Marks: 70

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of five short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: Statistical methods are applied in geography in order to make precise and unambiguous statements. These are used to describe and explain various geographical patterns and relationships

Unit-I

1. Statistics, Geography and Statistics; Significance of Statistics in geographical studies;
2. Primary and Secondary Data; Levels of data measurement: Nominal, Ordinal, Interval, and Ratio.

Unit-II

3. Descriptive statistics: histogram and frequency curve, Partitioned values: quartiles and deciles, Graphical representation of data
4. Measures of Central Tendency: Meaning of average, characteristics and types: Mean, Median and Mode.

Unit- III

5. Normal curve as a probability distribution: characteristics and area under curve
6. Measures of dispersion: absolute measures: range, quartile deviation, mean deviation, standard deviation, relative measure of dispersion: coefficient of variation
7. Measure of inequality: location quotient and Lorenz curve.

Unit- IV

8. Sampling: theory, methods, distribution and chance errors.
9. Correlation and regression: Scatter diagram, correlation by Spearman's Rank Difference and Karl Pearson's Product Moment, Significance testing of Correlation; Regression analysis regression equations construction of regression line, Simple Linear Regression properties of least square estimate, coefficient of determination. Computation of residuals and mapping.

Statistical Methods in Geography (Lab)

Course Code: P24GEO104P
30 Hrs (2 Hrs/week)
Credit: 1
Exam Time: 2 Hours

Marks for External: 20
Marks for Internal: 10
Total Marks: 30

Note: - *There will be three questions in all and candidate has to attempt two exercises.*

Distribution of marks for evaluation:

External Marks evaluation:

(Exercise = 10 File

record = 5

Viva-Voce = 5 marks)

Total -20

Internal Marks evaluation:

(File record = 5

Class attendance = 5

marks)

Total -10

Practical Record: A project file of at least 10 exercises on the below mentioned themes:

1. Use of Data in Geography: Geographical Data Matrix, Significance of Statistical Methods in Geography; Sources of Data, Scales of Measurement (Nominal, Ordinal, Interval, Ratio).
2. Tabulation and Descriptive Statistics: Frequencies (Deciles, Quartiles), Cross Tabulation, Central Tendency (Mean, Median and Mode, Centro-graphic Techniques, Dispersion (Standard Deviation, Variance and Coefficient of Variation).
3. Sampling: Purposive, Random, Systematic and Stratified.
4. Theoretical Distribution: Probability and Normal Distribution.
5. Association and Correlation: Rank Correlation, Product Moment Correlation, and Simple Regression, Residuals from regression
6. SPSS and Excel work in Statistics

Recommended Readings:

1. David M. Smith (1975), Patterns in Human Geography, Penguin, Harmondsworth.
2. Ebdon, D (1983), Statistics in Geography : A Practical Approach, Blackwell, London.
3. Gregory, S. (1978) Statistical Methods and the Geographer (4th Edition), Longman, London.
4. Gupta, S.P., Statistical Methods, Sultan Chand and Sons, Latest Edition.
5. Mathews, J.A. (1987), Quantitative and Statistical Approaches to Geography, Practical Manual, Pergamon, Oxford.
6. Pal, S.K. (1998), Statistics for Geoscientists; Techniques and Applications, Concept Publishing Company, New Delhi.

Course outcomes:

At the end of the course, the students would be able to:

- : Introduction to tools of quantitative information and data.
- : Enhancement of knowledge about statistical analysis of spatial pattern from geographical data
- : Enrichment of knowledge about inferential data analysis and errors associated with it.

M.Sc. Geography

First Semester

Fundamentals of Remote-sensing (T)

Course code: P24GEO105T

30 Hrs (2 Hrs /week)

Credits: 2

Time: 2 Hrs

Marks for External: 35

Marks for Internal Exam: 15

Total Marks: 50

Note: The examiner is requested to set five questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of five short answer type questions each of three marks). The candidate is required to attempt two questions in all selecting one from each unit carry ten marks and the compulsory Question No.1.

Objectives: The aim of this course is to apprise the students to various aspects of Aerial photographs, Remote Sensing and GIS which are the important elements of the Geospatial technology.

Unit -I

Definition; History of Remote Sensing; Stages of Remote Sensing, Physics of Remote Sensing: Electromagnetic Radiation (EMR), Characteristics; Electromagnetic Spectrum (EMS); Interactions Between Matter and Electro-Magnetic Radiation; Energy Interaction in The Atmosphere; Energy Interactions with The Earth's Surface and concept of signature. Radiation Laws. Atmospheric Windows; Types of Remote Sensing with Respect to Wavelength Regions and their significance. Sensor and Platforms. Historical Development; Types of Platforms and Sensors– Airborne Remote Sensing; Space Borne Remote Sensing; Orbital Elements of Satellite; Sensor Types Characteristics: Active and Passive Remote Sensing; Imaging Systems; Non-Imaging Sensors; Across Track and Along Track Scanners; concept of multispectral and Hyperspectral, Characteristics of Optical Sensors; Resolution.

Unit -II

Remote Sensing Satellites and Data Products: Overview of Different Satellite and Sensors for Earth Observations– Coarse; Medium and High-Resolution Missions (Landsat Series; SPOT; Sentinel, Quickbird; ASTER; Sentinel; SAR and Future Missions. IRS Mission.

Application of Remote Sensing in Natural Resources Management like: Water resources, Land use/ land Cover (LULC) Forest and Environmental issues. Application of Remote Sensing in Human Resources Management like: Agricultural issues and Impact Assessment on Indian Economics; Urban and regional Planning present issue & Challenges

M.Sc. Geography
First Semester
Fundamentals of Remote-sensing (Practical)

Course code: P24GEO105P
60 Hrs (4 Hrs /week)
Credits: 2
Time: 2 Hrs

Marks for External: 35
Marks for Internal Exam: 15
Total Marks: 50

Note for Paper Setters: The examiner shall set four questions, two from each unit. The candidates shall attempt three questions in all, selecting at least one question from each unit.

Distribution of Marks for Evaluation
Exercise= 10 Viva-voce = 15 File record=10

UNIT-I

1. Kinds of satellite images and Study of a satellite image - annotation (IRS - IB, IRS- IC etc.) (1 exercise)
2. Preparation of interpretation key of satellite imageries. (1 exercise)
3. Preparation of FCC and comparison of features on true colour, panchromatic (2 Exercise)
4. Separating physical and cultural features on an image (2 Exercise)
5. Interpretation of a Satellite Image (Landsat , LISS III, LISS IV, Cartosat & Sentail etc): Identification, Mapping and interpretation of Natural and Cultural features (2 exercises)

UNIT-2

6. Geo-referencing: GCP Based and Image to Image Geo-referencing (2 exercise)
7. Pre-processing of imageries (i) sub set (ii) resolution merge (2 Exercise)
8. Digital classification of satellite data (Supervised & Unsupervised) (2 Exercise)
9. Acquisition of open source satellite data from USGS / GLOVIS. (1 Exercise)
10. Acquisition of open source satellite data from BHUVAN (ISRO). (1 Exercise)

Recommended Readings:

1. Chanrda, A.M. and S.K. Ghosh (2006) **Remote Sensing and Geographical Information System**, Narosa Publishing House, New Delhi
2. Chang, Kang-tsung (2002) **Introduction to Geographic Information Systems**, Tata McGrawHills Publishing Company Ltd, New Delhi.
3. Chaunial, D.D. (2016) **Principles of Remote Sensing and Geographical Information System** (InHindi), Sharda Pustak Bhawan, Allahabad.
4. Joseph, George (2003) **Fundamental of Remote Sensing**, University's Press (India) Pvt. Ltd.,Hyderabad.
5. Lillesand, T.M. and Ralph W. Keifer (2002) **Remote Sensing and Image Interpretation**, JohnWiley & Sons, Inc., New York.
6. Panda, B.C., (2005) **Remote Sensing : Principles and Applications**, Viva Books Pvt. Ltd., NewDelhi.
7. Reddy, Anji, M. (2001) **Textbook of Remote Sensing and Geographical Information Systems**,BSP B.S. Publications, Hyderabad.
8. Siddique, M.A. (2006) **Introduction to Geographical Information Systems**, Sharda PustakBhawan, Allahabad.
9. Singh Surendra and A.N. Patel (1999) **Principles of Remote Sensing**, Scientific Publishers (India)

Course outcomes

At the end of the course, the students would be able to:

- : Acquaintance with fundamentals of remote sensing.
- : Development of capability to interpret the aerial photographs.
- : Enrichment of skills to extract information from resource satelliteimageries.

- : Awareness about digital image processing and its applications in resource monitoring and mapping.

M.Sc. Geography
First Semester
Sustainable Development

Course code: P24GEO106T
30 Hrs (2 Hrs /week)
Credits: 2
Time: 2 Hrs

Marks for External: 35
Marks for Internal Exam: 15
Total Marks: 50

Note: The examiner is requested to set five questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of six short answer type questions each of two and half marks). The candidate is required to attempt two questions in all selecting one from each unit carry ten marks and the compulsory Question No.1.

Objectives: Sustainable development applied in all branches of geography for future generation problem solution. This paper deals how to use different resources in present scenariowith saving resources for future generation.

Unit-I

1. Sustainable Development: Concepts and Applicability; Indices and Factors of Sustainable Development, Environmental Sustainability; Economic Sustainability; and Sustainable Development Goals
2. Resource Issues and Sustainable Development; Approaches to Study the Sustainable Development, Natural Resources Utilization, Role of Technology in Sustainable Development.

Unit-II

3. Sustainability of Water Resources, Sustainable Management of Forests, EcosystemManagement; Coastal Environments, Sustainable agriculture and food security; Environmental education for sustainable development,
4. Environmental Sustainability and Environmental Ethics; Resource Conservation and Development; Awareness and Education; Government Policies and Programmes; PopulationControl

Suggested Reading:

1. Blewett, J. (ed.) (2008): Understanding Sustainable Development, Routledge
2. Brundtland Commission (1987): Our Common Future, Oxford University Press
3. Chambers, N., Craig, S. and Wackernagel M. (2004): Sharing Nature's Interest, Earthscan Publications Ltd., London
4. Dalal-Clayton, B. and Bass, S. (2002): Sustainable Development Strategies: A Resource Book, Routledge
5. Dressner, S. (2002): The Principles of Sustainability, Earthscan Publications Ltd., London
6. Elliott, L. (2004): Global Politics of the Environment, Palgrave MacMillan, New York
7. Hulse, J.H. (2007): Sustainable Development at Risk: Ignoring the Past, Foundation Books
8. Knight, B., Chigudu, H. and Tandon R. (2002): Reviving Democracy: Citizens at the Heart of Governance, Earthscan Publications
9. Mollinga, P., Dixit, A. and Athukorala K. (ed) (2006): Integrated Water Resources Management, Sage, New Delhi
10. Rogers P. (2007): An Introduction to Sustainable Development, Earthscan Publications
11. Sachs, J. (2015): The Age of Sustainable Development, Columbia University Press

Course outcomes

At the end of the course, the students would be able to:

- : Enrichment of knowledge about sustainability concepts in modern world.
- : Augmentation of knowledge about programmes and policies of sustainable development.

M.Sc. Geography
First Semester
Seminar

Course code: P24GEO107S
30 Hrs (2 Hrs /week)

Credits: 2
Exam Time: 2 Hrs

Marks for Internal :00
Marks for External :50
Total Marks: 50

Note: Evaluation of the seminar will be done by the internal examiner(s) on the parameters as decided by staff council of the department. There will be no external examination /viva-voce examination

Course outcomes:

1. improve the articulation and presentation skill of students
2. Analyze and comprehend the given problem

M.Sc. Geography
First Semester
Social Geography

Course code: P24GEO108T
30 Hrs (2 Hrs /week)
Credits: 2
Time: 2 Hrs

Marks for External: 35
Marks for Internal Exam: 15
Total Marks: 50

Note: The examiner is requested to set five questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of five short answer type questions each of three marks). The candidate is required to attempt two questions in all selecting one from each unit carry ten marks and the compulsory Question No.1.

Objectives: Social Geography is an important aspect to understand the development of society and different social groups in India.

Unit-I

1. Social Geography: Nature, meaning and Development of Social Geography; Relationship of Social Geography with other branches of Social Sciences
2. Tribes: social formations, rural-urban and spatial distribution and impacts of development.
3. Castes: origin, caste and morphology of settlements, caste and clan territories and distribution of scheduled castes

Unit-II

4. Languages: classification, historical processes of diffusion and geographical distribution, linguistic regions
5. Religions: origin, historical background and spatial distribution of religious groups, minority and segregation in space, communalism
6. Towards a social geography of India; Concept of Social differentiation, Socio-Cultural Regions of India

Suggested Readings:

1. Ahmad, A. Social Geography, Rawat Publication, New Delhi, 1999.
2. Jean, D. and Sen, A. Economic Development and Social opportunity, Oxford University Press, New Delhi, 1996.
3. Dubey, S.C. Indian Society, National Book Trust, New Delhi, 1991.
4. Schwartzberg J. An Historical Atlas of South Asia, University of Chicago Press, Chicago, 1978.
5. Sen, A and Jean, D. Indian Development: Selected Regional Perspectives, Oxford University Press, 1996.
6. Smith, D. Geography: A Welfare Approach, Edward Arnold, London, 1977.
7. Sopher, D. An Exploration of India, Cornell University Press, 1980.
8. Rao, S. Personality of India, M.S. University Baroda, Vadodara, 1958.

Course outcomes:

At the end of the course, the students would be able to:

- : Enrichment of understanding about spatial dimensions of Indian society.
- : Cognizance of caste and clan territories in India.
- : Acquaintance with linguistic and religious profile of World
- : Awareness about social change and transformation in spatial context.

M.Sc. Geography

First Semester

Oceanography

Course code: P24GEO109T

30 Hrs (2 Hrs /week)

Credits: 2

Time: 2 Hrs

Marks for External: 35

Marks for Internal Exam: 15

Total Marks: 50

Note: The examiner is requested to set five questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of five short answer type questions each of three marks). The candidate is required to attempt two questions in all selecting one from each unit carry ten marks and the compulsory Question No.1.

Objectives: The course on oceanography will discuss the physiography of ocean floors and dynamics of ocean water. It will also provide an understanding about ocean-human interface including weather, climate, navigation, security and resource utilisation

Unit-I

15 Hrs

1. Definition and scope of oceanography, major sea voyages, oceanography and other sciences; distribution pattern of land and sea, origin of ocean basins: Wegner's drift hypothesis, and sea floor spreading and Plate Tectonics.
2. Depth of ocean, ocean floor profile-continental shelf, slope, ridge and deeps, abyssal plains; submarine canyons; coral reefs-origin and distribution; Ocean deposits; configuration of ocean floors of Indian Ocean, Atlantic Ocean and Pacific Ocean

Unit-II

15 Hrs

3. Temperature, Salinity and density of oceans; Dynamics of ocean currents; currents of Atlantic, Pacific and Indian Ocean. Tides: its origin and configuration
4. Ocean currents and their impact on climate and economy; oceans as source of food, mineral and energy resources; Sea-level changes; evidences, mechanism and impact; maritime law

Recommended Readings:

1. Denny, M., 2008, *How the Ocean works : An introduction to Oceanography*, Princeton University Press, New Jersey.
2. Garrison, T., 1995, *Essentials of Oceanography* Wardsworth Pub. Co., London.
3. S. Kerhsaw., 2004, *Oceanography : An Earth Science Perspective*, Routledge, UK.Sharma, R.C. and V. Vatal., 1986, *Oceanography for Geographers*, Chatanaya Publishing, Allahabad.
4. Shepart, F., 1969, *The Earth Beneath the Sea*, Athneum, Rev. ed., NewYork.Singh, Savindra., *Oceanography*, 2014, Pravalika Publications, Allahabad.
5. Thurman,V.Harold., 1987, *Essentials of Oceanography*, A Bell & Howell Company, Columbus/Toronto/ Sydney.
6. Von Arx, W.S., 1962, *An Introduction to Physical Oceanography*, Addison, Wesley,New York.

*Course outcomes****At the end of the course, the students would be able to:***

- : Enrichment of knowledge about topographic features of oceanic floor and deposits.
- : Augmentation of knowledge about movement and circulation in oceanic water.

M.Sc. Geography
Second Semester
Research Methodology (T)

Course code: P24GEO201T
45 Hrs (3 Hrs /week)
Credits: 3
Time: 2.5 Hrs

Marks for External: 50
Marks for Internal Exam: 20
Total Marks: 70

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of five short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: This paper is to familiarize the students with basics of research and its significance. It aims to make them understand the ways data are collected, classified, tabulated and analyzed. It also trains them to differentiate between casual and research-based statements that help them in their life.

Unit-I

1. Meaning and Purpose of Research? Types of Research; Social Science Research;
2. Identification of Research Question and Literature Surveying; Methods and Methodology in Human Geography.
3. Research Design, meaning, need and features of a good design

Unit-II

4. Measurements in research, scales; techniques of developing measurement tools.
5. Data collection, Methods, Preparation of questionnaires and schedules.
6. Surveys and experiments.

Unit-III

7. Scientific Method in Human Geography; Analytical Steps of the Scientific Method; The Routes of Scientific Explanation: Deductive and Inductive forms of reference; Explanation in Geography: Some Problems
8. From Quantitative to Qualitative Geography; Qualitative Data Production: Interviews (Process of Interviewing, Structure interviews and informal surveys; Depth Interviewing and Working with Groups); Observation (Participant Observation and Ethnography)
9. Processing and Analysis of data, statistics in research.

Unit-IV

10. Hypotheses Formulation and Testing.
11. Interpretation and Report Writing.
12. Ethics in Research.
13. Study about Research Paper, different journal, publications and UGC limitations.

**Research Methodology
(Lab)**

Course Code: P24GEO201P
30 Hrs (2 Hrs/week)
Credit: 1
Time: 2 Hours

Marks for External: 20
Marks for Internal: 10
Total Marks: 30

Note: - *There will be three questions in all and candidate has to attempt two exercises.*

Distribution of marks for evaluation:

External Marks evaluation:

(Exercise = 10 File

record = 5

Viva-Voce = 5 marks)

Total -20

Practical Record: A project file of at least 10 exercises on the belowmentioned themes:

1. Geographic Enquiry: Definition and Ethics; Framing Research Questions, Objectives and Hypothesis; Literature Review; Preparing Sample Questionnaire
2. Data Collection: Type and Sources of Data; Methods of Collection; Input and Editing
3. Data Analysis: Qualitative Data Analysis; Quantitative Data Analysis; Data Representation Techniques
4. Structure of a Research Report: Preliminaries; Text; References, Bibliography and Citations; Abstract
5. Preparation of Research Report

Recommended Readings:

1. Dey, Ian (1993), *Qualitative Data Analysis*, London: Routledge.
2. Eyles, John and David M. Smith (1988), *Qualitative Methods in Human Geography*, Oxford: Polity Press.
3. Harvey, David (1969), *Explanation in Geography*, London: Edward Arnold.
4. Hubbard, Phil et.al.(2002), *Thinking Geographically*, London: Continuum.
5. Hoggart, Keith et.al. (2002), *Researching Human Geography*, London: Arnold.
6. Huston, R.J. and J.D. Sidaway (2004), *Geography and Geographers*, London: Arnold.
7. Kitchin, Rob and Nicholas J. Tate (2000), *Conducting Research in Human Geography*, London: Prentice Hall.
8. Krishan, Gopal and Nina Singh (2016), *Researching Geography: The Indian Context*, New Delhi: Routledge India.
9. Limb, Melanie and Claire Dwyer (2001), *Qualitative Methodologies for Geographers*, London: Arnold.
10. Robinson, Guy M. (1998), *Methods and Techniques in Human Geography*, New York: John Wiley.
11. Seale, Clive (ed.) (2008), *Social Research Methods*, London: Routledge (Indian Edition).
12. Somekh, Bridget and Cathy Lewin (eds.) (2005), *Research Methods in the Social Sciences*, New Delhi: Vistaar Publications.

Course Outcomes:

- : Students would be able to formulate research questions;
- : Understand advantages and disadvantages of quantitative and qualitative approaches, and write a research proposal.

M.Sc. Geography
Second Semester
Geography of India

Course code: P24GEO202T
60 Hrs (4 Hrs /week)
Credits: 4
Time: 3 Hrs

Marks for External: 70
Marks for Internal Exam: 30
Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: To describe various geographical aspects of land, people and economy of Indian sub continent

Unit -I

1. India: basic information and regional diversity.
2. Physiographic: relief characteristics and physiographical divisions
3. Drainage systems and their functional significance.
4. Climate: characteristics, seasons and climatic regions of India.
5. Soil and vegetation types: their distribution, characteristics and conservation.

Unit- II

6. Agriculture: major characteristics, agricultural development after independence
7. Problems of Indian agriculture.
8. Impact of Globalization on Indian Agriculture
9. Irrigation: types, major projects with reference to Bhakra Nangal, Narmada and Damodar Valley Projects Indira Gandhi Canal, Interlinking of Rivers

Unit- III

10. Population: Distribution, growth and composition. Special reference to Migration scenario of India
11. Human Settlements : Classification , Problems and Management
12. Production, distribution, status of use and conservation of Minerals and Power Resources
13. Regional development and planning : special reference to NCR Region and Smart cities

Unit- IV

14. Manufacturing Industries: Introduction, factors, classification and Major industries . special reference to SEZ and economic corridors
15. Transport , communication and Space
16. International Trade: Imports and Exports. F.D.I and Globalization
17. Environment : Environmental pollution and management
18. Natural Hazards and Disasters: Major disasters in India

Suggested Readings:

1. Dubey, R. N., 1974: Economic Geography of India, Kitab Mahal, Allahabad
2. Hussain Majid (2015): Geography of India, Mc Graw Hill Education.
3. Joshi, H. L., 1990: Industrial Geography of India, Rawat Publications, Jaipur
4. Nag, P. and Sengupta, S., 1992: Geography of India, Concept publications. Co., New Delhi.
5. Singh, R. L.: India: A Regional Geography, N.G.S.I., Varanasi, 1971
6. Sharma, T. C. and Coutinho, O. 1988: Economic and Commercial Geography of India. Vikas Publishing House Pvt. Ltd, New Delhi.
7. Singh, S. and Saroha, J. 2019. Geography of India, Mc Graw Hill Education.

Course outcomes

At the end of the course, the students would be able to:

- : Provides understanding about the physical structure of India.
 - : Enrichment of understanding about spatial organization of agriculture and irrigation systems.
- : Acquaintance with geographical distribution and production of major resources.
 - : Enhancement of knowledge about spatial distribution of industries and international trade of India.

M.Sc. Geography
Second Semester
Regional Development and Planning

Course code: P24GEO203T
60 Hrs (4 Hrs /week)

Credits: 4

Time: 3 Hrs

Marks for External: 70

Marks for Internal Exam: 30

Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: Regional Development and planning are the core areas of geographical inquiry. Decentralized planning has a profound role in managing the evolved situation.

Unit -I

1. Conceptual and theoretical framework: Concept of development, regional development;
2. concept of region and regional planning; geography and regional planning;
3. Selection of indicators and measures of regional disparities.

Unit -II

4. Regional Growth Theories: Friedman's core-periphery theory; polarization and trickle-down effect theory of Hirschman; circular and cumulative causation model of Myrdal; growth pole theory of Perroux.
5. Planning process: types of planning; regional planning and its rationale, principles and objectives. Regions for Planning: characteristics, hierarchy, need, and demarcation; planning regions of India.

Unit -III

6. Surveys for planning: Concept and functions; types of surveys
7. Regional surveys, diagnostic surveys, techno-economic surveys.
8. Development of Island area.

Unit IV

9. Experiences of regional development and planning in India - multi level planning (state, district, block and panchayat level planning); Regional Policies in the Indian Five Year Plans; planning policies for regional development; regional backwardness: criteria, strategy and programmes for backward area development. NITI AAYOG: its structure, functions and achievements
10. Development Perspective. Service and market centers planning; Growth centre and regional development with reference to India and France; Decentralized planning: themes and issues; Regional planning: Development strategies in the 21st century
11. Case studies from selected countries: Regional planning in USA (TVA); Regional planning in India (DVC & NCR); Regional planning in Netherlands (Polders).

Recommended Readings:

1. Bhatt, L.S. 1972. *Regional Planning in India*. Statistical Publishing Society, Calcutta.
2. Chand, M and V.K. Puri. 1985. *Regional Planning in India*. Allied Pub. Pvt. Ltd. New Delhi.
3. Coates, B.R. and R.J. Johnston. 1977. *Geography and Inequality*. Oxford University Press, Oxford. Government of India. 2013. *Report of the Committee for Evolving a Composite Development Index of States*. Ministry of Finance. http://finmin.nic.in/reports/Report_CompDevState.pdf
4. Friedmann, J. and William Alonso. 1967. *Regional Development and Planning: a Reader*. MIT Press, Cambridge Massachusetts
5. Kuklinski, A.R. ed. 1972. *Growth Poles and Growth Centres in Regional Planning*. Monton, The Hague.
6. Misra R.P. et al. eds. 1974. *Regional Development Planning in India*, Vikas, New Delhi.
7. Mohan, Krishna. 2005. *Addressing Regional Backwardness: An Analysis of Area Development Programmes in India*, New Delhi: Manak Publications.
8. Raza, Moonis. 1988. *Regional Development*, Heritage, New Delhi.
9. Singh, Nina. 2015. "Regional Backwardness in India: An Exploration of Demographic Indicators". *Population Geography*, vol.37, No. 1&2, pp. 13-24.
10. Surya Kant and Nina Singh. 2015. *Geography Development Public Policy: Select Essays of Gopal Krishan*. RK Books, New Delhi.
11. Kant, Surya et al. 2004. *Reinventing Regional Development*. Rawat Publications, Jaipur.
12. Sundram, K. V. 1977. *Urban and Regional Planning in India*. Vikas Publishig House Pvt Ltd, New Delhi.

Course Outcomes:

- : familiarized with the theoretical foundations and conceptual grounding of this branch;
- : understand and evaluate the concept of region in geography and its role and relevance in regional development;
- : comprehend the regional development and planning process in India.

M.Sc. Geography
Second Semester
Political Geography

Course code: P24GEO204T

60 Hrs (4 Hrs /week)

Credits: 4

Time: 3 Hrs

Marks for External: 70

Marks for Internal Exam: 30

Total Marks: 100

***Note:** The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.*

Objectives: This course is designed to provide students an understanding of the theoretical concepts of political geography; to have a familiarity with the most current topics in political geography

Unit -I

1. Definition, approaches, scope and importance of Political Geography
2. Study of different geographical-political schools of thought
3. Recent developments in political geography in 19th and 20th century.

Unit -II

4. Elements of Political Geography: Physical elements (location, size and shape)
Human elements (Population-size, density & distribution, growth, composition, race, ethnographic and religious composition)
5. Economic elements (Transportation-surface, air & water ; foreign trade and investment)

Unit-III

6. Concepts of Nation, State, Nation-State; Emergence and growth of territorial state;
7. Globalization and the Crisis of the Territorial State; Forms of Governance: Unitary and Federal.
8. Federalism: Definition, concept, approaches and types, geography and federalism

Unit-IV

9. Rise and Demise of German Geopolitics; Geopolitics in the post Cold War
10. World—S.B. Cohen's model of Geo-strategic and Geo-political regions.
11. India as a regional power in South Asia; National and Regional political parties in India; Women as a marginalized section in Indian politics; Inter-state water disputes in India (special reference to SYL canal).

Recommended Readings:

1. Agnew, J.A. (1987), **Place and Politics**, Boston: Allen and Unwin.
2. Agnew, J.A. (1998), **Geopolitics**, London: Routledge.
3. Blacksell, Mark (2003), **Political Geography**, London: Routledge.
4. Flint, Collin and Taylor, P.J. (2011), **Political Geography**, New Delhi: Pearson.
5. Cox, Kevin R. (2008), **The Sage Handbook of Political Geography**, New Delhi: Sage.
6. Dicken, Peter (2003), **Global Shift**, New Delhi: Sage.
7. Dikshit, R.D. (2000), **Political Geography: The Spatiality of Politics**, New Delhi: TataMcGraw Hill.
8. Dodds, Klaus (2007), **Geopolitics**, New York: Oxford University Press.
9. Gallaher, Carolyn et.al. (2009), **Key Concepts in Political Geography**, New Delhi: Sage.
10. Jones, Martin, Rhys Jones and Michael Woods (2003), **An Introduction to Political Geography**, London: Routledge.
11. Khor, Martin (2001), **Rethinking Globalization**, London: Zed Books.
12. Nash, Kate (2000), **Readings in Contemporary Political Sociology**, Oxford: Blackwell.
13. Painter, J. (1995), **Politics, Geography and Political Geography**, London: Arnold

Course outcomes

At the end of the course, the students would be able to:

- : Familiarization with the conceptual framework of geo-political issues.
- : Augmentation of knowledge about state and nation in geographic perspective.
- : Enhancement of knowledge about global strategic views and geo-politics in post-cold war era.
- : Awareness about contemporary geo-political situation and issues in India.

M.Sc. Geography
Second Semester
Fundamentals of GIS and GNSS (T)

Course code: P24GEO205T
30 Hrs (2 Hrs /week)
Credits: 2
Time: 2 Hrs

Marks for External: 35
Marks for Internal Exam: 15
Total Marks: 50

***Note:** The examiner is requested to set five questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of five short answer type questions each of three marks). The candidate is required to attempt two questions in all selecting one from each unit carry ten marks and the compulsory Question No.1*

Objectives: The aim of this course is to apprise the students to various aspects of Aerial photographs, Remote-Sensing and GIS which are the important elements of the Geospatial technology.

Unit - I

Introduction to GIS: Definitions and historical development of GIS; Components of GIS; Scope; Interdisciplinary Relations; Applications areas of GIS; Data Structure in GIS (Raster and Vector); DBMS; GIS Data Types: Spatial and Non-Spatial Data/ Attribute data, Coordinate System and Map Projection & datum. Spatial Data Analysis; Concept of Topological Analysis; Overlay Analysis; Network Analysis; Neighborhood; Interpolation; Data Integration; Spatial Join and Query; Connectivity; Proximity Analysis: Buffering; Neighborhood

Unit - II

GIS Software and WEB GIS: Different type of GIS Software; Introduction to Open Source GIS; Concept and History of Web GIS; Components of Web GIS; Citizen Science; Volunteered Geographic Information; Crowd sourcing.

Introduction to Global Positioning System: Definition; History and Development; GPS Satellite Constellations; GPS Segments: Space; Control; User; Signals & Codes; GPS Receivers; Operating Principle; GPS Applications in Various Fields; Concept of DGPS and WAAS; GNSS And Types (NAVSTAR; GLONASS; GALELIO); IRNSS.

M.Sc. Geography
Second Semester
Fundamentals of GIS and GNSS (Practical)

Course code: P24GEO205P
60 Hrs (4 Hrs /week)
Credits: 2
Time: 2 Hrs

Marks for External: 35
Marks for Internal Exam: 15
Total Marks: 50

Note for Paper Setters: The examiner shall set four questions, two from each unit. The candidate shall attempt three questions in all, selecting at least one question from each unit.

Distribution of Marks for Evaluation
Exercise = 10 Viva-voce = 15 File record=10

Unit - I

- Creation of Geo-database and shape file (2 exercises).
- Vectorization of spatial data: Point, polyline and Polygon (2 exercise).
- Creation of layers with help of satellite data/Toposheet/Maps (1 exercise).
- Adding attributes to point, polyline and polygon layers (1 exercise).
- Statistical and geometrical calculation of various layers (1exercise).
- Displaying of attributes data and graphical representation of data on map using various methods (1 exercise).
- Geo-referencing: GCP based Geo-referencing (2 exercise).

Unit - II

- Editing and building topology, joining non-spatial data (2exercise).
- Analysis: overlay, query and proximity (2 exercises).
- Symbolization: chorochromatic, choropleth and point proportional. (2 exercise).
- GPS: Introduction to the GPS and different pages in GPS device (2 exercises).
- Collection of GCP and mobile mapping Composite profiles with creation map from GCP Point using Interpolation (1 exercise).
- Preparation of layout for various thematic maps in various files formats and printing (1 exercise).

Suggested Readings:

1. Burrough, P.A. and McDonnell, R. (1998). Principles of Geographic Information Systems. Oxford University Press, Oxford.
2. Bhatta Basudeb (2014). Remote Sensing and GIS. Oxford University Press, Oxford.
3. Chang, K.T. (2003). Introduction to Geographic Information Systems. Tata McGraw Hill Publications Company, New Delhi.
4. Demers, M. N. (2000). Fundamentals of Geographic Information Systems. John Wiley and Sons, Singapore
5. Heywood I, Cornelius S and Carver S. (2000). An Introduction to Geographical Information Systems, Longman, New York.

M.Sc. Geography

Third Semester

Climatology

Course code: P24GEO301T

60 Hrs (4 Hrs /week)

Credits: 4

Time: 3 Hrs

Marks for External: 70

Marks for Internal Exam: 30

Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: This paper deals with the basic concepts of Climate applied in Geography.

Unit-I

1. Definition of weather and climate; Climatology and Meteorology.
2. Origin, composition and structure of atmosphere.
3. Solar radiation, greenhouse effect, heat budget and temperature distribution.

Unit-II

4. Atmospheric pressure and its distribution pattern.
5. Theories of general circulation and planetary winds.
6. Atmospheric Moisture: humidity, evaporation, condensation; precipitation formation theories and types of precipitation, acid rain.
7. Stability and instability of atmosphere, air masses and fronts.

Unit-III

8. Weather systems: Origin and characteristics of extra tropical and tropical cyclones.
9. Walker circulation- ENSO and La Nina, origin of monsoons and jet streams.
10. South-East Monsoon and its relation with Indian economy

Unit-IV

11. Climatic classification: Bases of climatic classification by Koppen, Trewartha and Thornthwaite.
12. Climatic change: pattern, evidences and theories of climate change.
13. Global warming and its impacts on earth systems.
14. Climate change and Global warming impacts on Indian economy.

Books Suggested:

1. Athrens, C. D. Meteorology Today: An Introduction to Weather, Climate and Environment, West Publishing Co., 1994
2. Barry, R. G. and Chorley, R. J. Atmosphere, Weather and Climate, Marth Ren, 2010.
3. Critchfield, H. J. General Climatology, Prentice Hall of India, New Delhi, 1987.
4. Collins, J.M. Climatology, Oxford, 2014.
5. Das, P.K. The Monsoons, National Book Trust, New Delhi, 1984.
6. Lal, D.S. Climatology, Chaitanya Publishing House, Allahabad, 1966.
7. Lutgens, F.K. and Tarbuck, E.J. The Atmosphere: An Introduction to Meteorology, Prentice Hall of India, New Delhi, 2010.
8. Miller, A.A. Climatology, Methuen and Co., London, 1979.
9. Oliver, J.E. and Hidore, J.J. Climatology: An Atmospheric Science, Pearson Education Inc. New Delhi, 2003.
10. Ram Sastry, AA, Weather and Weather Forecasting, Publication Division, New Delhi.
11. Trewartha G. T., an Introduction to Climate, McGraw Hill Company, New York, 1980.

Course outcomes:

At the end of the course, the students would be able to:

- : Enhancement of knowledge about atmospheric constituents and structure.
- :Development of scientific understanding about climatic elements and their characteristics
- : Sharpens the understanding about atmospheric moisture, stability, and instability and weather systems.
- : Enrichment of knowledge about climatic classification, climate change and global Warming.

M.Sc. Geography
Third Semester
Urban Geography

Course code: P24GEO302T

60 Hrs (4 Hrs /week)

Credits: 4

Time: 3 Hrs

Marks for External: 70

Marks for Internal Exam: 30

Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: What is urban geography these days? Cities have become the centre of social, political, and economic activities that now govern the lives of the majority of human kind. There are new geographical patterns forming within and between cities. They serve both as the cores of, and means for connecting, events taking place on the local, regional, national, and international levels, with all these tiers spatially interacting

Unit-I

1. Urban geography: concepts, nature and scope.
2. Approaches to study urbanization and urban systems
3. Origin and evolution of towns and factors of urban growth;
4. The global context of urbanization: trends and pattern; cycle of urbanization.

Unit -II

5. theories of urban origins
6. Functional classification of cities: concepts and scheme of classification.
7. Rural Urban Fringe: structural characteristics and its development.
8. City and region: concepts of influence and dominance, methods of delimitation of area of influence and dominance.
9. SEZ: concept, policies and consequences.

Unit -III

10. Urban morphology and land use structure: city core, commercial, industrial and residential areas.
11. Classical models of city structure: concentric zone model by E.W. Burgess, sector model by Homer Hoyt, multiple nuclei model by Harris and Ullman,
12. Modifications of the classical models: Kearsley' modifications of Burgess model, Mann's model of midsize British city, White's model of the 21st century city and Vance's urban realms model.
13. Internal structure of third world cities: Bazar model and colonial model of South Asian cities, model of South East Asian cities and model of African cities.

Unit -IV

14. Social Area Analysis; Bases of residential segregation.
15. Diffusion theories by Bylund, Morrill, Hudson and Vance.
16. Rank size rule.
17. Law of primate city

Books Suggested:

1. Mayer, H.M. and Kohn, C.F. (1968) Readings in Urban Geography. The University of Chicago Press, Chicago.
2. Berry, J.E.(1970) Geography Perspective on Urban System, Prentice Hall, New Jersey.
3. Cater, Herald (1972)The study of Urban Geography, Edward Arnold, London.
4. Datta, A. and Shaban, A.(2017) Mega-Urbanization in Global South: Fast Cities and New Urban Utopias of the Post-colonial State, Routledge: London and New York.
5. Johnson, J. (1974)Suburban Growth, John Wiley and Sons, London.
6. Kaplan, Wheeler and Holloway(2007) Urban Geography, John Wiley, USA.
7. Clark, D. (1982), Urban Geography, Croom Halm, London and Cambridge.
8. Northern, R.M.(1979) Urban Geography, John Wiley, Toronto.
9. Michael P. (2004) Urban Geography: A Global Perspective, Routledge, USA.
10. Parnell, S. and Oldfield, S. (2014)The Routledge Handbook on Global Cities, Routledge, London.
11. Ramachandra,R(1992) Urbanization and Urban System in India, Oxford, London.
12. Raymond and Murphy(1960) The American Cities: An Urban Geography, McGraw Hills, NewYork.
13. Scott, A.J. (2002) Global City-Regions: Trends, Theory, Policy, Oxford Press, London

Course outcomes:

At the end of the course, the students would be able to:

- : Provides understanding about evolution of towns and pattern of urbanization.
- : Enrichment of knowledge about economic and functional characteristics of cities.
- : Acquaintance with urban morphology and land use models.
- : Familiarization with theories of urban development.

M.Sc. Geography
Third Semester
Economic Geography

Course code: P24GEO303T
60 Hrs (4 Hrs /week)
Credits: 4
Time: 3 Hrs

Marks for External: 70
Marks for Internal Exam: 30
Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: This paper deals with the basic concepts of economic activities and economic development

Unit-I

1. Definition, nature, scope, importance, recent trends and approaches in economic geography.
2. Relationship of economic geography with economics.
3. Economic activities and their classification and role of economic activities in economic development

Unit-II

4. Network structure and economic activities, impact of transport on economic activities, spatial variation in production and transport cost.
5. Location theories of Weber, Losch, Christaller, Ullman and Krugman

Unit-III

6. World Economies: bases of classification, patterns and characteristics of developed and developing economies of the world.
7. Economic development: meaning, evolution, goals, measures, patterns, problems and theories

Unit-IV

8. Globalization and recent trends in pattern of international trade. Impact of Globalization on Indian economics
9. Emergence of a new global economy-transnational integration and its spatial outcomes.
10. Major regional trade blocks of the world, free trade initiatives (GATT, UNCTAD, and WTO).
11. India's economic policies of 21st century

Suggested Readings:

1. Gautam, A. 2010. Advanced Economic Geography. Sharda Pustak Bhawan, Allhabad.
2. Hartshorne, T. A. and Alexander, J. W. 2001. Economic Geography. Prentice Hall of India. New Delhi.
3. Hudson, R. 2005. Economic Geography. Sage Publication, New Delhi.
4. Jones, C. F. and Darkenwarld, G. G. Economic Geography. The Macmillan and Company. New York.
5. Knox, P. 2003. The Geography of World Economy. Arnold, London.
6. Saxena, H.M. 2013. Economic Geography. Rawat Publications, Jaipur.
7. Wheeler, J.O. and Muller, P.O. 1985. Economic Geography. John Wiley and Sons. New York

Course outcomes:

At the end of the course, the students would be able to:

- : Provides understanding about the location and distribution of economic activities.
- : Familiarization with location theories of economic activities.
- : Provides understanding about the location and distribution of economic activities
- : Acquaintance with the spatial organization of world economies.
- : Knowledge about trade blocs, trends in trade and various processes of globalization.

M.Sc. Geography
Third Semester
Electoral Geography

Course Code: P24GE0304T
60 Hrs (4 Hrs /week)
Credits: 4
Time: 3Hours

Marks for External: 70
Marks for Internal: 30
Total Marks: 100

Note: *The examiner is requested to set nine questions in all; selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks).The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1. All questions carry equal marks.*

Objective: To trace out the geographical and theoretical dimensions of elections and inculcate the ability to solve the problems in this dynamic field of knowledge.

Unit-I

1. Electoral Geography: Nature, Scope and Approaches.
2. Legal framework of elections in India and the Election Commission of India.

Unit-II

3. Cleavage Model and Political Parties: Social Cleavage theory and the Indian Party system.
4. Geography of representation: Types of electoral abuse and mal apportionment in elections.

Unit-III

5. Geography of voting: voting patterns and voting behavior.
6. Friends and Neighbors voting: concept and impact in elections.

Unit-IV

7. Electoral systems in the world: Non-proportional and Proportional electoral systems.
8. Electoral data in India: Sources, Levels of availability and scope of research.

Course outcomes

1. Enable to understand the geographical and theoretical dimensions of elections.
2. To know about the legalities of elections in India.
3. Inculcate problem solving attitude towards socio-political problems with geographical background.
4. Provide awareness about the worlds' political representation systems.
5. To find out the new facts through data in the field of knowledge.

Recommended Books

1. Dikshit, R.D.(1995)GeographyofElections:TheIndianContext,RawatPublications,Jaipur and New Delhi.
2. Jalan,S.(2015)ElectoralGeography,RawatPublications,JaipurandNewDelhi.
3. Taylor,P.J.&R.J.Johnston(2016)GeographyofElections,RoutledgeLibraryEditions.
4. Johnston, R. & Pattie, C. (2006) Putting Voters in their place: Geography and Elections in Great Britain, Oxford Geographical and Environmental Studies Series, Oxford University Press.

References

1. Forest,B.(2017)Electoralgeography:Frommappingvotestorepresentingpower, Geography Compass. 2017;e12352. <https://doi.org/10.1111/gec3.12352>.
2. Campbell, R., Cowley, P., Vivyan, N., & Wagner, M. (2019). Why friends and neighbours?Explainingtheelectoralappealoflocalroots. *JournalofPolitics*,81(3), 937–951. <https://doi.org/10.1086/703131>
3. Johnston,R.J.(1978).Friends-and-neighboursvotinginVictoria:Anote.In*Politics* (Vol.13,Issue1,pp.151–154).<https://doi.org/10.1080/00323267808401648>
4. Johnston, R., Pattie, C., Pemberton, H., & Wickham-Jones, M. (2016). “If You’ve Got FriendsandNeighbours”:ConstituencyVotingPatternsfortheUKLabourPartyLeader in 2010. *Journal of Elections, Public Opinion and Parties*, 26(1), 58–77. <https://doi.org/10.1080/17457289.2015.1099537>
5. Thakur, B., & Singh, R. (2017). Electoral Geography of Punjab Vidhan Sabha Elections, 2017:ASpatialAnalysis.*InternationalJournalofEconomicResearch*, 14(20),549-558.
6. Rodden,J.,(2010).TheGeographicDistributionofPoliticalPreferences. *TheAnnual Review of Political Science*, 13, 321–340.
7. Charney,I.,&Malkinson,D.(2015).Betweenelectoralandurbangeography:Voting patternsand socio-spatial dynamics in Tel Aviv. *Applied Geography*, 58, 1–6. <https://doi.org/10.1016/j.apgeog.2015.01.002>

M.Sc. Geography
Third Semester
Disaster Management

Course code: P24GE0305T

60 Hrs (4 Hrs /week)

Credits: 4

Time: 3 Hrs

Marks for External: 70

Marks for Internal Exam: 30

Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1

Objectives: This paper deals with the basic concepts of hazards and disasters at world and India level.

Unit-I

1. Disasters and hazards: definition, nature and classification.
2. Geography and disasters: major disasters of world, disaster profile of India.
3. Tectonic disasters: volcanoes, earthquakes, tsunamis, landslides

Unit-II

4. Hydrological disasters: floods and droughts.
5. Climatic disasters: cyclones and heavy precipitation events
6. Human induced disasters: epidemics, industrial and transport disasters; wars and terrorism induced disasters. COVID-19 (A case study in India)

Unit-III

7. Approaches to disaster management; Disaster management cycle: Crisis management: quick response and relief, recovery, development;
8. Risk management: risk identification and risk assessment, risk reduction - preparedness, prevention and mitigation, risk transfer;
9. Act and policy: IDNDR, UNISDR, DMA-2005. Early Warning System, India Disaster Resource Network
10. Disaster management in India: policy and organizational structure setup. Covid-19 Management in India.

Unit-IV

11. Planning for disaster mitigation measures and preparedness
12. Post disaster recovery and rehabilitation. Role of NDRF
13. Impacts of disaster on society and economy.
14. Geospatial technology applications in disaster prevention and monitoring.

Books Suggested:

1. Nlaikie, P (1994) At Risk: Natural Hazards, People's Vulnerability and Disasters, Routledge, London.
2. Carter, NW (1991) Disaster Management: A Disaster Manager's Handbook, ADB, Manila.
3. Cuny, FC (1983) Disasters and Development, Oxford University Press.
4. Hewitt, K (1977) Regions of Risk: A Geographical Introduction to Disasters, Longman, Harlow.
5. National Policy on Disaster Management (2009) Ministry of Home Affairs, Govt. of India, New Delhi.
6. Smith, K (1996) Environmental Hazards: Assessing Risks and Reducing Disasters, Routledge, London.
7. Varley, A. Disaster, Development and Environment, John Wiley and Sons, Chichester

Course outcomes:

At the end of the course, the students would be able to:

- : Understanding about the spatial dimensions and distribution of disasters
- : Enrichment of knowledge about natural and human induced disasters.
- : Acquaintance with the concepts of disaster management, vulnerability and mitigation
- : Awareness about the role of geospatial technology in disaster management.

M.Sc. Geography

Third Semester

Cartographic Techniques and Morphometric Analysis (Practical)

Course code: P24GEO306P

120 Hrs (8 Hrs /week)

Credits: 4

Time: 3 Hrs

Marks for External: 70

Marks for Internal Exam: 30

Total Marks: 100

Note for Paper Setters: The examiner shall set four questions, two from each unit. The candidate shall attempt three questions in all, selecting at least one question from each unit.

Distribution of Marks for Evaluation

Exercise = 30 Viva-voce = 20 File record=20

UNIT-I

1. **Simple Diagrams:**
 - a) Line and bar graph 1 exercise
 - b) Poly graph 1 exercise
 - c) Rainfall deviation diagram 1 exercise
2. *One dimensional diagram:*
 - a) Simple 1 exercise
 - b) Comparative bar 1 exercise
 - c) Compound bar 1 exercise
3. *Two dimensional diagrams:*
 - a) Proportional circle 1 exercise
4. *Three dimensional diagrams:*
 - a) Cube Diagram 1 exercise
5. *Weather Diagrams:*
 - a) Climograph (Taylor and Foster) 2 exercise
 - b) Hythergraph 1 exercise
 - c) Ergograph 1 exercise

UNIT-II

6. **Distribution maps:**
 - a) Dot method 1 exercise
 - b) Isopleth 2 exercise
 - c) Choropleth- Bivariate 2 exercise
7. *Diagrams:*
 - a) Snail Diagram 1 exercise
 - b) Cartogram (rectangular, traffic flow) 1 exercise

UNIT-III

1. Scheme of Topographical Maps
2. Profile analysis: transverse and longitudinal
 - a) Serial profiles
exercise 1
 - b) Superimposed profiles
exercise 1
 - c) Composite profiles
exercise 1
 - d) Projected profiles
exercise 1
3. Linear Aspects:
 - a) Relationship between stream order and stream Number
exercise 1
 - b) Relationship between stream order and average stream length
exercise 1
4. Areal Aspects:
 - a) Drainage frequency
Exercise 1
 - b) Drainage Density
Exercise 1

UNIT- IV

5. Relief Aspect:
 - (a) Area Height Curve
Exercise 1
 - (b) Altimetric frequency curve
Exercise 1
 - (c) Hypsographic curve
Exercise 1
 - (d) Hypsometric integral curve
Exercise 1
 - (e) Clinographic curve
Exercise 1
6. Slope Analysis
 - (a) Wentworth's method of average slope
Exercise 1

M.Sc. Geography
Fourth Semester
Ecosystem and Environment

Course code: P24GEO401T
60 Hrs (4 Hrs /week)
Credits: 4
Time: 3 Hrs

Marks for External: 70
Marks for Internal Exam: 30
Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: The basic objectives of the course are to apprise the students about our environment, to understand its interrelationship with man and his linkages with other organisms, which vary in different biomes. Also to sensitize the students with the Environmental problems and degradations.

UNIT-I

1. Geography and ecosystem: fundamental concepts.
2. Concept of ecosystem: bases, types, components and function of ecosystem.
3. Energy flow in ecosystem: food chain, food web, tropic levels, ecological production and ecological pyramids.

UNIT-II

4. Biome: scheme of classification: factors affecting the distribution of biomes.
5. Salient features of the following biomes:
 - a. Tropical evergreen rain forest biome
 - b. Savanna biome
 - c. Monsoon biome
 - d. Temperate biome
 - e. Marine biome
 - f. Mountain biome
 - g. Desert biome
6. Ecosystem approach and its relevance in geography.
7. Ecological regions of India.
8. Man-environment relationship: classification of resources; use and ecological imbalance with reference to soils, forests and energy resources.

UNIT-III

9. Biodiversity and conservation: preservation and conservation of ecosystem through resource management.
10. Environmental issues: climate change, ozone depletion, global warming and global cooling
11. Concept of air, water, and noise pollution: level of problem, causes and measurement tools.

UNIT-IV

12. International efforts for environment management and conservation: The Stockholm Conference, the Earth Summit, Kyoto Protocol, Paris declaration and after. Solar Alliance and India's efforts
13. Environment Governance: environment policies and environmental legislation in India: prevention & protection Act of wild life, water, air, forest, environment protection and National Environment Tribunal Act.
14. Environmental management- concept, methods and approaches. Management of soil, forest and mineral resources; Disaster Management; Conservation of natural resources; Emerging environmental problems and issues in India, Environmental policies, programmes, awareness and movements in India

Suggested Readings: _

1. Agarwal, A. and Sen, S. The Citizens Fifth Report. Centre for Science and Environment New Delhi 1999.
2. Bertalanffy, L. General Systems Theory, George Bragiller, New York, 1958.
3. Bodkin, E. Environmental Studies, Charles E. Merrill Pub Co., Columbus, Ohio, 1982.
4. Chandna, R.C.: Environmental Awareness, Kalyani Publishers, New Delhi, 1998.
5. Chorley, R.J., Geomorphology and General Systems Theory, U.S.G.S. Professional Paper, 500B, 1962.
6. Eyre, S.R. and Jones, G.R.J. Geography as Human Ecology, Edward Arnold, London, 1966.
7. Kormondy, E.J. Concepts of Ecology, Prentice Hall, 1989.
8. Mishra, S.P. and Pandey, S.N. (2016) Essential Environmental studies, Ane publications New Delhi.
9. Nobel and Wright: Environmental Science, Prentice Hall, New York 1996.
10. Odum, E.P. Fundamentals of Ecology, W.B. Saunders, Philadelphia, 1971.

Course outcomes:

At the end of the course, the students would be able to:

- : Familiarization with the concept and elements of ecosystem.
- : Enrichment of knowledge about the characteristics of different biomes.
- : Awareness about the inter-linkages between human artifacts and natural environment
- : Acquaintance about world environmental problems and policy framework

M.Sc. Geography
Fourth Semester
Population Geography

Course code: P24GEO402T
60 Hrs (4 Hrs /week)
Credits: 4
Time: 3 Hrs

Marks for External: 70
Marks for Internal Exam: 30
Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: This course introduces the spatial distribution of population with causative factors. It also deals with various theories and concepts related with population. Study of population is an essential component in planning of various human related issues.

UNIT-I

1. Population Geography: Definition, nature and scope;
2. relationship with other disciplines –demography and population studies; sources of data with particular reference to India – census,vital or civil registration system,
3. Sample Registration System, Sample surveys with particular reference to NSSO and NFHS;
4. Problems of their reliability and comparability.

UNIT-II

5. Population Distribution and Growth: Factors affecting population distribution. Population control movements.
6. Population growth -trends and determinants; spatial dimension of population growth in India. Environmental quality.
7. Views of socialist writers, optimum theory, demographic transition model.

UNIT-III

8. Components of population change: trends and patterns in fertility and mortality levels; Theories of fertility;
9. Migration: major international migrations; features of internal migration in India; Theories of migration; population composition and characteristics - age and sex composition, literacy, marital status and economic characteristics of population
10. Theories of population: Malthus, Ricardo and Marx.

UNIT-IV

11. Population policies and its types; India's Population Policy: Post independence development – Reproductive and Child Health Programme.
12. Population problems and environmental implications.
13. Future of World population. Population polices of Developed and Developing countries.

Suggested Readings:

1. Bhende, A. A. and Kanitkar, T. (2011): Principles of Population Studies, Himalaya Publishing House, Mumbai.
2. Cassen, Robert & Bates, Lisa M. (1994): Population Policy: A New Consensus Overseas Development Council, Washington, D.C.
3. Chandna, R. C. (2016): Population Geography: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi.
4. Demko, G.J. and others (Eds.) (1971): Population Geography, Reader, McGraw- Hill Books Co., New York
5. Graff, M., and Bremner, J. (2014): A Practical Guide to Population and Development, Washington DC: Population Reference Bureau.
6. Hassan, I. (2020) Population Geography: A Systematic Exposition, Routledge, London.
7. May, J.F. (2012) World population policies: their origin, evolution, and impact, Washington DC: Springer.
8. Mahajan, N. (2014) Population Geography, R.K. publishers, Delhi.
9. Murray C. J. L., J. A. Salomon, C. D. Mathers and A. D. Lopez (), Summary Measures of Population Health: Concepts, Ethics, Measurement and Applications. WHO, Geneva.
10. Newbold, K Bruce (2016) Population geography: Tools and Issues.
11. Qazi, S.A (2010). Population Geography, APH publishers.

Course outcomes:

At the end of the course, the students would be able to:

: Knowledge about population data base, methodological issues and mapping.

: Familiarization with the dynamics of population and demographic dividends.

: Enrichment of knowledge about population theories and models.

: Awareness about population policies of different countries and relation between population and environment.

M.Sc. Geography
Fourth Semester
Town and Country Planning

Course code: P24GEO403T

60 Hrs (4 Hrs /week)

Credits: 4

Time: 3 Hrs

Marks for External: 70

Marks for Internal Exam: 30

Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: The major objective of this paper is to highlight the role of geographic concepts and methods in settlement planning at the micro level. Divided into four units, it deals with conceptual and methodological issues, planning strategies, and case studies

Unit-I

1. Human Settlement: A brief history with its relevance in modern context.
2. Settlement System: Types and Functions.
3. Town and Country Planning Practice in India.

Unit-II

4. Town Planning: Definition, nature, importance and scope.
5. Preparation of town plan: Statement of objectives, surveys and data collection for town planning with special reference to urban land surveys, formulation of policies, zoning, locational and space
6. Requirements for residential, work, and play areas.
7. Planning of transport and public utilities.
8. Problems of town planning in India.
9. Urban planning policies in Indian Five-Year Plans.
10. Indian town planning experiences- Master Plan of Delhi and Chandigarh.

Unit-III

11. Country Planning: Definition, nature, importance and scope.
12. Rural Land use and its determinants.
13. Rural Land use, land suitability, and soil surveys.

Unit-IV

14. Rural development in India during Five Year Plans.
15. Planning for the following problems of rural India:
 - a. Drinking water
 - b. Floods and Soils
 - c. Public utility services
 - d. Poverty and employment.

Suggested Readings:

1. Benjamin N.: *Cities made of boundaries : mapping social life in urban form*, London: UCL Press, 2018.
2. Bhardwaj, R.K.: *Urban Development in India*, National Book Trust, New Delhi, 1974.
3. Chapin, F.S. & Kaiser E.J., *Urban Landuse Planning*, Harper Bros., New York, 3rd Ed., 1985.
4. Hiraskar , G.K.: *Fundamentals of Town Planning*, Dhanpat rai publications, 2018
5. Jackson, J., *Surveys for Town and Country Planning*, Hutchinson Univ. Library, London, 1966.
6. Modak, V.N. and V.N. Ambedkar, *Town and Country Planning and Housing*, Oriental Longman, New Delhi, 1971.
7. TCPO, *Regional Planning Efforts in India*, Government of India, New Delhi, 1985.
8. Govt. of India, *Report of the National Commission on Urbanisation, Vols. I & II*, Ministry of Urban Development, New Delhi, 1988.

PROJECT REPORT

(DISSERTATION)

Course Code : P24GEO404D
Credits- 12

Marks for Internal Assessment – 100
Marks

External Marks Project Report
(Dissertation) – 200 Marks

Duration (Hours per week):

Objectives:

- To acquaint the student with the importance of field work as one of the methodologies in Geography.
- To sensitize the student about pre-field work preparations, conduct of the field work, post- field work-based analysis and interpretation
- To acquaint the student with the requirements of the writing of a dissertation.

COURSE CONTENTS: Since this paper is of practical nature only, therefore contents of syllabus need not to be organized into units. Students must prepare a dissertation on a topic that involves field investigation and data collection.

Dissertation in Geography: The work will involve:

- Statement of objectives and scope of field investigation;
- Methods of field work for studies of different scales(macro, meso , and micro)
- Preparation of a questionnaire ;sampling techniques, data collection tools and procedure
- Processing and analysis of collected data
- Representation and interpretation of data/ information.
- Writing a dissertation on assigned problem involving field investigations

Note

1. The candidates are required to submit their dissertation one week before the commencement of end semester examination.
2. Assessment of dissertation and viva voce on it will be done by a Board of Examiners, consisting of external examiner, internal examiner and the chairperson of the department.
3. Improvement/repeat cases must prepare either an improved form of their earlier work or prepare a new one. They must get it approved and signed by the faculty member teaching the course at their parent department.
4. Internal assessment may include written assignments, snap tests, participation in discussion in the class, term papers, attendance etc.

M.Sc. Geography
Fourth Semester
Geography of India (Regional and Systematic)

Course Code: P24GE0405T
60 Hrs (4 Hrs /week)
Credits: 4
Time: 3 Hours

Marks for External: 70
Marks for Internal: 30
Total Marks: 100

Note: *The examiner is requested to set nine questions in all; selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks).The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1. All questions carry equal marks.*

Objectives: The geographic dimensions of India in terms of its political and administrative characteristics. The physical and climatic attributes and their interface with developmental strategies. The human and economic dimensions of India in a spatial perspective.

Unit-I

1. Unity in diversity of India: Unifying mechanism and divisive streaks.
2. Evolution of the administrative map of India since Independence.

Unit-II

3. Role of language, religion and culture in the formation of regions.
4. The question of regional disparity and identity in India.

Unit-III

5. Regionalization schemes of India: Physiographic (SP Chatterjee), Climatic (Koeppen and Trewartha), Agricultural (Jasbir Singh and CB. Mamoria), and Industrial (BN Sinha).

Unit-IV

6. Northwest India as a Geographic Entity: Jammu & Kashmir, Himachal Pradesh, Haryana, Punjab and Union Territories of Delhi and Chandigarh.
7. Land: Physiography and drainage.
8. People: Population number, distribution and density, growth and urbanization.
9. Economy: Agriculture, Industry and Transport.

Suggested Readings:

1. Ahmad Aijazuddin: *Social Geography*, Rawat Publication, New Delhi, 1999.
2. Chandna, R.C.: *Geography of Population*, Kalyani Publishers, Delhi, 1998.
3. Deshpande, C.D.: *India- A Regional Interpretation*, ICSSR and Northern Book Center, New Delhi, 1992.
4. Gautam, A.: *Advanced Geography of India*, Sharda Pustak Bhawan, Allahabad, 2009.
5. Hussain, M.: *Geography of India*, Tata McGraw Hill Pub. Company Ltd., New Delhi, 2008.
6. Govt. of India: *India, A Reference Annual* : Ministry of Information & Broadcasting, GOI, New Delhi, 2018.
7. Krishan, G.: *The Vitality of India: A Regional Perspective*, Rawat Publications, 2017
8. Muthiah, S.: *A Social and Economic Atlas of India*, Oxford University Press, Delhi, 1987.
9. Siddhartha, K.: *India: The Physical Aspects*, Transworld Media & Communications Pvt. Ltd., New Delhi.
10. Singh, J.: *India-A Comprehensive Systematic Geography*, Gyanodya Prakashan, Gorakhpur, 2003.
11. Spate O.H.K. & A.T.A. Learmonth: *Geography of India and Pakistan*, Methuen, London (First Indian Edition,1984, Munshiram Manoharlal, New Delhi), 1967.
12. Sukhwai, B. L.: *India: A Political Geography*, Allied Publishers, New Delhi.
13. Tirtha, Ranjit: *Emerging India*, Conpub. Ann Arbour, U.S.A. Michigan, 2006.
14. Tiwari, R.C.: *Geography of India*, Prayag Publishers, Allahabad, 1999.
15. Wadia, D. N.: *Geology of India*, Macmillan & Co., London, 1953.

M.Sc. Geography
Fourth Semester
Applied Climatology

Course code: P24GEO406T
60 Hrs (4 Hrs /week)
Credits: 4
Time: 3 Hrs

Marks for External: 70
Marks for Internal Exam: 30
Total Marks: 100

Note: The examiner is requested to set nine questions in all, selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks). The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1.

Objectives: To introduce and discuss the basic topics of applied climatology. To understand how these concepts can be useful in everyday planning and operations

Unit-I

1. Applied Climatology: History; Development; Atmospheric Concern and Awareness; Climate Impact Assessment.
2. Basic Climatic Elements: Radiation; Temperature; Moisture, Clouds and Precipitation; Air Pressure and Winds.
3. Major Controls of Climate: Latitude, Geographic Position, Land and Water, Prevailing Winds, Ocean Currents, Altitude, Pressure and wind System.

Unit-II

4. Weather Analysis: Data Acquisition and Dissemination
5. Weather Forecasting: Methods, Types, Accuracy
6. Medium Range Forecasts, Long Range Forecasts.
7. Satellites in Weather Forecasting.

Unit-III

8. Air Pollution: Sources and Types of Air Pollution. Meteorological Factors Affecting Air Pollution
9. Acid Precipitation.
10. Urban Heat Island

Unit-IV

11. Climatic Change: Definition and Detection: Sea floor Sediment, Glacial Ice, Tree Rings,
Oxygen Isotope-Analysis
12. Natural Causes of Climate Change: Plate Tectonics, Volcanic Activity, Orbital Variations,
Solar Variability
13. Human Impact on Global Climate

Suggested Readings:

1. Barry, R.G. & Chorley, R.J.: *Atmosphere, Weather and Climate*, Methuen Co. Ltd., London, 5th Edition, 1987.
2. Bhutani, Smita: *Our Atmosphere*, Kalyani Publishers, Ludhiana, 2000.
3. Darrel Hess: *Mcknight's Physical Geography: A Landscape Appreciation*, Prentice Hall of India Pvt. Ltd., New Delhi, 2012.
4. Frederick K. Lutgens & Edward J. Tarbuck: *The Atmosphere: An Introduction to Meteorology*, Prentice Hall of India Pvt. Ltd., New Delhi, 2012.
5. Lal, D.S.: *Climatology*, Thoroughly revised and Enlarged Edition, Sharda Pustak Bhaban, Allahabad, 2009.
6. Lydolph, P.E.: *The Climate of the Earth*, Rowman Nad Allanheld, Totowa, New Jersey, 1985.
7. Oliver, John E.; Oliver, John and Hidore John J: *Climatology: An Atmospheric Science*, Prentice Hall of India Pvt. Ltd. New Delhi, 2001
8. Strahler, A.N.: *Modern Physical Geography*, John Wiley and Sons, New York, Singapore, 1987.
9. Strahler, A and A. Strahler: *Introducing Physical Geography*, 6th Edition, JohnWiley & Sons, Hoboken, New Jersey, 2013.
10. Strahler, A. and A. Strahler: *Physical Geography: Science and Systems of Human Environment*. 3rd Edition, John Wiley, Hoboken, New Jersey, 2005.
11. Trewarth, G.T.: *Eath's Problem Climate*, University of Visconsin, Madision, 1961.
12. Trewartha, G.T.: *An Introduction to Climate*, McGraw Hill, New York, 1980, Fifth Edition (International Student Edition).

M.Sc. Geography
Fourth Semester
Geography of Migration

Course Code: P24GE0407T
60 Hrs (4 Hrs /week)
Credits: 4
Time: 3 Hours

Marks for External: 70
Marks for Internal: 30
Total Marks: 100

Note: *The examiner is requested to set nine questions in all; selecting two questions from each unit and one compulsory question (Question No.1 based on entire syllabus will consist of seven short answer type questions each of two marks).The candidate is required to attempt five questions in all selecting one from each unit and the compulsory Question No.1. All questions carry equal marks.*

Objectives: This course endeavors to encourage the understanding of issues and challenges of human migration from spatial perspectives. Different forms of human migration, its characteristics and regional patterns shall be highlighted. Place of migration issues in the 2030 SDG agenda shall be evaluated.

Unit-I

Migration Overview: basic concepts, data source, measures, and historical perspectives.

Unit-II

Internal Migration: concepts, characteristics, typologies, regional patterns, explanations and implications.

Unit-III

International Migration: concepts, characteristics, typologies, regional patterns, explanations, and consequences.

Unit-IV

Migration Policies and Governance: regional models across global north-global south.

Migration, Environment, and Climate Change linkages: floods, droughts, desertification, natural disasters; migration, development, and sustainable development goals.

Suggested Readings:

1. Brettell, C.B., and Hollifield, J.F. (eds.) 2014. Migration Theory : Talking across Disciplines, 3^d ed. New York :Routledge.
2. Castles, S., de Haas, H. and Miller, M.J. 2014. The Age of Migration : International Population Movements in the Modern World, 5th ed. New York and London : Guilford.
3. Hatton, T., and Williamson, J.G. 1998. The age of mass migration : causes and economic impact, New York : Oxford University Press.
4. Kosinsk, L.A., Elahi, K.M. eds.) 1985. Population redistribution and development in South Asia, Boston : Kluwer Academic Publishers Group.

Course outcomes:

At the end of the course, the students would be able to:

1. This course should allow the candidates to learn about the basic concepts related to human migration.
2. Furthermore, the student will become conversant with the different forms of human migration, its characteristics, types, regional patterns, major drivers and consequences across geographical context.
3. Students should be able to appreciate the various dimensions of global environmental change and human migration.