

Khandesh College Education Society's  
**Moolji Jaitha College, Jalgaon**  
An "Autonomous College" Affiliated to  
KBC North Maharashtra University, Jalgaon



## **SYLLABUS**

# **M.A./M. Sc. Geography** **(Semester III & IV)**

**Under Choice Based Credit System (CBCS)**

**[w. e. f. Academic Year: 2020-21]**

**Program specific outcomes (PSO):**

**PSO1:** Demonstrate and understanding of structure and functioning of stereoscopes, calculating height of any object, get 3D image of aerial photographs and their interpretation.

**PSO2:** Acquire the skills of digital image processing like enhancement, georeferencing and classification of satellite image using GIS softwares and this database will used in agriculture, soil, watershed development, disaster management and other fields.

**PSO3:** Develop the ability to understand basics of tourism development that can be used to develop tourist center in surrounding region.

**PSO4:** Develop the ability to understand and practice ethics of environment.

**PSO5:** Realize need of surrounding scientific watershed development knowledge in our district to understand the impotence of disaster management and to make it more effective.

## Course Structure: M.A./M. Sc. II (Geography)

**Duration:** The duration of M.A./M.Sc. (Geography) degree program shall be Two years.

Term / Semester	Course Module	Subject Code	Title of Paper	Credit	Hours per Week
III	DSC	GG. 301	Geography of resource management	4	4
	DSC	GG. 302	Geostatistical methods	4	4
	DSC	GG. 303	Practical: Interpretation of satellite images & aerial photography	4	8
	DSC	GG.304	Practical: Interpretation of SOI topographical maps	4	8
	SEC	GG. 305	Remote sensing techniques	4	4
	DSE	GG. 306	A) Regional planning & development	4	4
			B) Geography of sustainable development	4	4
IV	DSC	GG. 401	Applications of geoinformatics	4	4
	DSC	GG. 402	Research methodology in geography	4	4
	DSC	GG. 403	Practical in digital image processing	4	8
	DSC	GG. 404	Project based on field visit	4	8
	GE	GG. 405	A) Disaster management	4	4
			B.) Geography of tourism	4	4
	DSE	GG. 406	A) Geographical thoughts	4	4
			B) Watershed management & planning	4	4

**DSC:** Discipline Specific Elective Core Course;      **SEC:** Skill Enhancement Course;  
**DSE:** Discipline Specific Elective (DSE) Course;      **GE:** Generic Elective Course  
**GG-YSC** : Geography (Y-year; S-Semester; C-Course number)

### Examination Pattern for M.A./M.Sc.

Nature	Marks
<b>External Marks</b>	<b>60</b>
<b>Internal Marks</b>	<b>40</b>
<b>Total Marks</b>	<b>100</b>

**M.A/M.Sc (Geography) : Semester – III**  
**GG-301: Geography of resource management**

**Total Hours: 60**

**Credits: 4**

**Course objectives:**

- To understand the concept of resource management.
- To know the importance of management of resources.
- To know the need of conservation of resources.

**Course outcome:**

Student will be able to

- Learn about the optimum use of resources.
- Understand the importance of reuse, reproduce and recycle of resources.
- Aware the need of conservation of resources.

**Unit I: Introduction of resource management**

**12 h**

- Introduction, meaning and definitions
- Concept of resource
- Resource management
- Scope of resource management in geography.
- Importance of resources management
- Types of resources
  - Natural resources
  - Man made resources
- Conservation of resources

**Unit II: Land and soil resources management**

**18 h**

- Land resources:
  - Land as a resource
  - Importance of land resource management
  - Land degradation due to agriculture, mining, deforestation
- Soil:
  - Factors of soil formation
  - Degradation of soil and conservation measures
- Methods of land and soil resources management

**Unit III: Water, natural vegetation and wildlife resources management**

**15 h**

- Water:
  - Distribution of water
  - Problems of water availability
  - Conservation and water resources management
- Natural vegetation and wildlife management:
  - Distribution of natural vegetation: world & special reference of India

- Conservation and management natural vegetation and wildlife
- Methods of water, natural vegetation and wildlife resources management

#### **Unit IV: Planning and population resources relationship**

**15 h**

- Concept of resources planning
- Need of resources planning
- Resources planning with references of India
- Population resources
  - The growth of population: world & India
  - Population-resource relationships

#### **References:**

1. Das, Gupta A.(1951). Economic and Commercial Geography. A Mukharjee & Co.Pvt. Ltd, Calcutta.
2. Hartshorn & Truman A.(1998). Economic Geography. Prentice Hall India Learning Private Limited; 3 edition, Delhi.
3. Agarwal, A.et.al. : The Citizen's Fifth Report, Center for Science and Environment, New Delhi, 1999.
4. Chandna, R.C.(1996) Geography of Population, Kalyani Publishers, Ludhiana.
5. Chandna, R.C.(1996) Environmental Geography, Kalyani Publishers, Ludhiana.
6. Kates, R.W. & Burton, I (Eds.)(1986). Geography of Resources and Environment, Vol.I & II University of Chicago Press, Chicago.
7. Misra, A.(2004). Environmental Studies, Selective and Scientific Books, New Delhi.
8. Saxena, H.M.(1999). Environmental Geography, Rawat Publications, Jaipur and New Delhi.

### **M.A/M.Sc (Geography): Semester – III**

#### **GG-302: Geostatistical methods**

**Total Hours: 60**

**Credits: 4**

#### **Course objectives:**

- To provides fundamental knowledge of Geostatistical methods to students.
- To find out the relationship between statistical techniques and geography.
- To find out cause and effect relationship between the variables.

#### **Course outcome:**

Student will be able to

- Learn the advanced statistical approaches.
- Find out the inferences while doing research.
- Explain the statistical data more effectively.

#### **Unit I: Introduction geostatistical methods**

**10 h**

- Geography and Statistical methods
- Characteristic of Geographical data
- Levels of measurement

**Unit II: Probability and probability distribution****15 h**

- Venn diagram
- Probability distribution
  - Binomial distribution
  - Poisson distribution

**Unit III: Regression analysis and time series****20 h**

- Regression:
  - Simple regression
  - Multiple regression
- Time series:
  - Moving average
  - Least square method

**Unit IV: Parametric and non parametric test****15 h**

- Parametric Test:
  - T- test
  - F- test
- Non parametric Test:
  - Chi-square test
  - K-S Test

**References:**

1. Berry B. J. L. and Marble D. F. (eds.) (1968). Spatial Analysis – A Reader in Geography.
2. Hammond P. and McCullagh P. S., (1978). Quantitative Techniques in Geography: An Introduction, Oxford University Press, London.
3. King L. S., (1969). Statistical Analysis in Geography, Prentice-Hall, New Jersey.
4. Mahmood A., (1998). Statistical Methods in Geographical Studies, Rajesh Publication, New Delhi.
5. Pal S. K., (1998) Statistics for Geoscientists, Tata McGraw Hill, New Delhi.
6. Sarkar, A. (2013). Quantitative geography: techniques and presentations. Orient Black Swan Private Ltd., New Delhi
7. Silk J., (1979). Statistical Concepts in Geography, Allen and Unwin, London.
8. Yeates M., (1974). An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York.
9. Shinha, Indira (2007) Sankhyikibhugol. Discovery Publishing House, New Delhi

## M.A/M.Sc (Geography): Semester – III

# GG-303: Practical: Interpretation of satellite imagery and aerial photography

**Total Hours: 60**

**Credits: 4**

### Course objectives:

- To develop interpretative skill of students.
- To know the terminology of aerial photographs.
- To identify physical and cultural features from satellite imagery and aerial photographs.

### Course outcome:

Student will be able to

- Calculate the height of an object.
- Make accurate survey of any region.
- Learn new advance mapping techniques.

### Unit I: Satellite imagery

**15 h**

- Introduction.
- Annotation strip.
- Scale and area calculation.
- Identification of features.
- Preparation of sketch.
- Interpretation.

### Unit II: Aerial photograph

**15 h**

- Introduction.
- Type of photograph.
- Type of stereoscope.
- Overlapping.
- Average scale of aerial photograph.
- Calculation of number of photograph
- Side information.

### Unit III: Interpretation of aerial photograph

**15 h**

- Orientation of photograph.
- Transformation of points.
- Calculation of scale.
- Identification of features.
- Elements of interpretation.
- Interpretation of photographs.

#### **Unit IV: Calculation of height scale and focal length**

**15 h**

- Calculation of height of aircraft.
- Scale calculation.
- Focal length calculation.
- Calculation height of object with parallax bar.

#### **References:**

1. Murthy J.V.S. (1994). Watershed Management in India, Wiley Eastern Ltd. New Delhi.
2. Paranjape S. and Other (1980) : Water based Development, Bharat GyanVigyanSamithi, New Delhi.
3. Mutreja K.N. (1990). Applied Hydrology, Tata McGraw Hill Pub. Co. Ltd. New Delhi.
4. Shing R.J. (2000). Watershed planning and Management, Yash Publishing House, Bikaner.
5. ChandaB. ,Dattaa D., Mujumdar (2001) : Digital Image Processing and Analysis, Prentice-Hall of India.
6. Prithvish Nag and M. Kudrat (1998) : Digital Remote Sensing , Concept Publishing Co. New Delhi-
7. M. Anji Reddy (2006). Text book of Remote Sensing and GIS, 3rd Ed., BS Publications, Hyderabad.

### **M.A/M.Sc. (Geography): Semester – III**

#### **GG-304: Practical: Interpretation of SOI topographical maps**

**Total Hours: 120**

**Credits: 4**

#### **Course objectives:**

- To learn surveying techniques in geography.
- To study US and USGS toposheets.
- To know the importance of field study in geography.

#### **Course outcomes:**

Student will be able to

- Enhance interpretative skills of the students.
- Know the physical as well as cultural features.
- Understand the overall scenario of the region.

#### **Unit I: SOI toposheet**

**15 h**

- Introduction
- Indexing
- Grid reference
- Qualitative and quantitative methods of representing relief.

#### **Unit II: US toposheet**

**15 h**



- Interpretation of us toposheet
- Introduction
- Grid reference
- Signs and symbols
- Interpretation

**Unit III: USGS toposheet**

**15 h**

- Introduction
- Grid reference
- Signs and symbols
- Interpretation

**Unit IV: Excursion and village survey**

**15 h**

- Excursion report and village survey

**References:**

1. Tamaskar B.G. and Deshmukh V.M. (1974), Geographical Interpretation of Indian Topographical Maps. Orient Longman Limited Bombay
2. Ramamurthy, K. (1982): Map interpretation, Madras
3. Petrie N. (1992), Analysis and Interpretation of Topographical Maps. Orient Longman Limited Calcutta.
4. Meux A. H. (1960), Reading Topographical Maps. University of London Press Limited
5. Archer J. E and Dalton T. H. (1968), Field work in Geography B.T. Batsford Limited London
6. Wheeler K.S. Ed (1970), Geography in the field. Blond Educational, London.
7. Gupta, K. K. and Tyagi, V. C. (1992): Working with maps, Survey of India Publication, Dehradun
8. Vaidyanadhan. R. (1968). Index to a set of 60 topographical maps, CSIR, New Delhi
9. Ramamurthy, K. (1982): Map Interpretation, Rex Printer, Madras
10. Vaidyanadhan, R. (1968): Index to a Set of Sixty Topographic Maps: Illustrating Specified Physiographic Features From India, Council of Scientific and Industrial Research, Ministry of Education, Government of India
11. Gupta, K. K. and Tyagi, V. C. (1992): Working with Maps, Survey of India Publication, Dehradun
12. Tamaskar, B. G. and Deshmukh, V. M. (1974): Geographical Interpretation of Indian Topographical maps, Orient Longman, Kolkata
13. Dury, G. H. (1972): Map Interpretation, Pritman and Sons, London
14. Singh, G. (1996): Map Work and Practical Geography, Vikas Publication, New Delhi

**M.A/M.Sc. (Geography): Semester – III**  
**GG-305: Remote sensing techniques**

**Total Hours: 60**

**Credits: 4**

**Course objectives:**

- To know the techniques of remote sensing.
- To understand the basics of remote sensing.
- To know the types and functions of satellite.

**Course outcomes:**

Student will be able to

- Use the satellite data in various fields.
- It is an important tool in land resource exploration and disaster management.
- Enhance the visual interpretation skill.

**Unit I: Overview of remote sensing** **15 h**

- Remote sensing – definition, concept and principles, national and international scenario
- Energy resources, radiation principles, EM radiation and EM spectrum
- Black body radiation, laws of radiation, spectral signature
- Interaction of EMR with atmosphere and earth's surface

**Unit II: Remote sensing platforms** **20 h**

- Platforms – types and their characteristics
- Satellites and their Characteristics – geo-stationary and sun-synchronous
- Earth resources satellites -LANDSAT, SPOT, IRS, IKONOS satellite series
- Meteorological satellites – INSAT, NOAA, GOES

**Unit III: Remote sensing sensors** **15 h**

- Sensors – types and their characteristics, across track (whiskbroom) and along track(pushbroom) scanning
- Optical Mechanical Scanners – MSS, TM, LISS, WiFS, PAN
- Concept of resolution and Types – spatial, spectral, temporal and radiometric
- Basic concept and principles of thermal, microwave and hyperspectral sensing

**Unit IV: Visual image interpretation** **10 h**

- Basic principles, types, steps and elements of image interpretation
- Satellite image visualization: gray scale image, true color and false color composites
- Instruments for visual interpretation
- Applications of image interpretation

**References:**

1. Jensen, J.R., 2000. Remote sensing of the environment: An earth resource perspective, Prentice Hall, Upper saddle river, New Jersey.
2. Joseph, George, (2003), Fundamental of Remote Sensing, University Press (India) Pvt. Ltd, Orient Longman Pte. Ltd., Hyderabad, India
3. Lillesand, T.M. and Kieffer, R.W., 2003. Remote Sensing and Image Interpretation, 5th Edition. Wiley, New York
4. Panda, B. C.,(2008). Remote Sensing: Principles and Applications, Viva Books Private Limited, India
5. Nag P. and Kudrat M. (1998). Digital Remote Sensing. Concept Publishing. , New Delhi

**M.A/M.Sc. (Geography): Semester – III**  
**GG-306 (A): Regional planning and development**

**Total Hours: 60****Credits: 4****Course objectives:**

- To understand the concept of regional planning.
- To study the need of regional planning.
- To study the application of regional planning.

**Course outcomes:**

Student will be able to

- Know the importance of planning regions.
- Understand the hierarchy of planning regions.
- Explain the concept of regional planning.

**Unit I: Introduction to regional planning****10 h**

- Concept of regional planning
- Nature and scope of regional planning
- Aims and objectives
- Approaches in regional planning
- Historical development

**Unit II: Types and techniques****15 h**

- Types of regions
- Need and importance of regional planning
- Techniques of regional planning: analytical technique.
- Procedural techniques.

**Unit III: Surveys and methods for planning****20 h**

- Concept and functions of surveys
- Types of surveys: regional and diagnostic survey
- Role of geospatial technology
- Environment impact assessment
- Multilevel planning (state, district and block level planning)
- Planning commission and NITI aayog: role and functions

**Unit IV: Regional development models and theories**

**15 h**

- Central place theory
- Periphery friedmann's model
- Myrdal model
- Growth pole theory

**References:**

1. Chand, Mahesh(2001). Regional Planning in India. Allied Publishers limited,New Delhi.
2. Chaudhuri, J.R. (2001): An Introduction to Development and Regional Planning with special reference to India, Orient Longman, Hyderabad.
3. Doyle, T. and McEachern, D. (1998): Environment and Politics, Routledge, London.
4. Friedmann, J. and Alonso, W. (ed.) (1973): Regional Development and Planning, MIT Press, Cambridge Massachesetts.
5. Chand, M. (2001). Regional Planning in India. New Delhi: Allied Publishers limited.
6. Misra, R. P. (1992). Regional Planning. New Delhi: Concept Publishing Company.

**M.A/M.Sc (Geography) : Semester – III**

**GG-306 (B): Geography of sustainable development**

**Total Hours: 60**

**Credits: 4**

**Course objectives:**

- To understand the concept of sustainable development.
- To aware the student about judicious use of resources.
- To promote the students for the use of non-conventional energy resources.

**Course outcomes:**

Student will be able to

- Know the environmental ethics.
- Understand about conservation of resources.
- Know the role of individual in sustainable development.

**Unit I: Introduction to sustainable development**

**10 h**

- Definition,
- Components,
- Limitations and historical background
- Environmental sustainability and ethics.

## **Unit II: Utilization of resources and sustainability**

**15 h**

- Energy resource:
  - Coal
  - Petroleum
  - Natural gas
  - Nuclear power
- Renewable resources:
  - Forest
  - Water

## **Unit III: Issues of sustainability**

**15 h**

- Tourism.
- Infrastructure development.
- Land utilization:
  - Urban.
  - Rural.
- Water management:
  - Urban (domestic and industrial).
  - Rural (domestic and agricultural).
- Air Pollution:
  - Urban (pollution from vehicle and Industries).
  - Rural (pollution from Pesticides and fungicides).

## **Unit IV: Sustainable development policies and program**

**20 h**

- Inclusive development: education, health.
- Human right to health; poverty and diseases.
- Challenges of universal health.
- Policies and program.
  - Rio+20; illustrative SDGs; goal-based development.
  - Financing for sustainable.
  - Development.
  - Principles of good governance.
- National environmental policy, clean development mechanism (CDM)

### **References:**

- Agyeman, Julian, Robert D. Bullard and Bob Evans (Eds.) (2003) *Just Sustainabilities: Development in an Unequal World*. London: Earthscan.
- Ayers, Jessica and David Dodman (2010) –Climate change adaptation and development I:the state of the debate. *Progress in Development Studies* 10 (2): 161-168.
- Baker, Susan (2006) *Sustainable Development*. Milton Park, Abingdon, Oxon; New York,N.Y.: Routledge.
- Brosius, Peter (1997) –Endangered forest, endangered people: Environmentalist Representations of indigenous knowledge, *Human Ecology* 25: 47-69.

- Lohman, Larry (2003) –Re-imagining the population debate. Corner House Briefing 28.
- Pravin Chandra Trivedi, Niranjana Sharma (2010) Plant Resource utilization and conservation, Pinter Publishers, United Kingdom.
- Jeyabalan Sangeetha, Devarajan Thangadurai, Goh Hong Ching, Saher Islam (2019) Biodiversity and Conservation, Apple Academic Press, Florida.
- Catherine Mulligan (2019) Sustainable Engineering: Principles and Implementation, CRC Press, Florida.
- Prasenjit Mondal, Ajay K. Dalai (2017) Sustainable Utilization of Natural Resources, CRC, Florida.

**M.A/M.Sc (Geography) : Semester – IV**  
**GG-401: Applications of geoinformatics**

**Total Hours: 60**

**Credits: 4**

**Course objectives:**

- To introduce the students about knowledge of Geoinformatics.
- To apply the techniques in different fields.
- To develop the cartographic techniques using hardware and software.

**Course outcomes:**

Student will be able to

- Understand the mapping processes.
- Enhance the map making skill of students.
- Know the applications of Geoinformatics in different fields.

**Unit I: Remote sensing applications**

**12 h**

- Scope of remote sensing applications - potentials and limitations
- Resource mapping and integrated information for sustainable development
- Resource evaluation: soils, minerals forest and agriculture.

**Unit II: Applications in land use and land cover analyses**

**12 h**

- Land use classification, principles and systems
- Mapping and monitoring of land use / land cover and regional planning
- Urban land use, urban sprawl and urban planning.

**Unit III: Water resource, coastal and near shore applications**

**20 h**

- Mapping, monitoring of surface water bodies, tanks, lakes / reservoirs
- Hydro geomorphic mapping, ground water zoning from unconsolidated, semi consolidated and hard rocks.
- Satellite sensors for coastal zone environment
- Coastal landforms and evolution
- Coastal dynamics and shore line changes and coastal wetlands

**Unit IV: Environmental and disaster management applications**

**16 h**

- Mapping and monitoring of natural hazards
  - a. Cyclones / floods, b. Droughts, c. Landslides,
  - d. Volcanoes e. Earthquakes
- analysis of human-induced hazards
  - a. Deforestation b. Erosion c. Siltation

## References:

1. SPRS Technical Commission VII(2002): Symposium on Resource Environmental Monitoring, ISRS Annual Convention, IIRS, Dehradun.
2. Deekshatulu, B. L.(1990): Description and use of Land use/Landcover, NRSA, Hyderabad.
3. Sudershana, R. Mitra, D. Mishra, Roy, P.S., Rao, D. P.(2000): Subtle Issues in Coastal Management, IIRS, Dehradun.
4. Harris, J. E. (1990): Earthwatch – The Climate from space, Ellishorwood Ltd., Midsower Norton.
5. Lal, D. S. (1998): Climatology, Chaitanya Publishing House, Allahabad.
6. Escalante, R. B. (2012): Remote Sensing- Advances techniques and Plateforms, Intech, Rijeka Croatia.
7. Escalante, R. B. (2012): Remote Sensing Application, Intech, Rijeka Croatia.
8. Roy, P.S., Dwivedi, R. S. (2010): Remote Sensing Application [www.nrsc.gov.in/Learning-Center](http://www.nrsc.gov.in/Learning-Center), EBook. html.

## M.A/M.Sc (Geography): Semester – IV

### GG-402: Research methodology in geography

**Total Hours: 60**

**Credits: 4**

#### Course objectives:

- To create awareness about research methodology in the field of geography.
- To understand the scientific view of geographical phenomenon.
- To know the methods of data collection.

#### Course outcomes:

Student will be able to

- Develop the research ability and get solution of various problems in geography.
- Learn how to design the research problem.
- Write project report.

#### Unit I: Research methodology & defining the research problem

**15 h**

- Introduction
- Research methodology
  - Meaning of research
  - Objectives of research
  - Motivation in research
  - Types of research
  - Research methods versus methodology
  - Research process
  - Criteria of good research



- Defining the research problem
  - What is a research problem
  - Selecting the problem
  - Necessity of defining the problem
  - Technique involved in defining a problem

## **Unit II: Research design and sampling design**

**20 h**

- Research design
  - Meaning of research design
  - Need for research design
  - Features of a good design
  - Important concepts relating to research design
  - Different research designs
- Sampling design
  - Implications of a sample design
  - Steps in sampling design
  - Criteria of selecting a sampling procedure
  - Characteristics of a good sample design
  - Different types of sample designs
  - How to select a random sample

## **Unit III: Methods of collection processing and analysis of data**

**15 h**

- Introduction
- Concept of data & importance
- Types of data
  - Primary data
  - Secondary data
  - Collection methods of primary data
  - Collection methods of secondary data
- Processing and analysis of data
- Processing operations
- Statistical calculation
  - Measures of central tendency
  - Measures of dispersion
  - Measures of relationship
  - Simple regression analysis
- Methods of displaying analysed data
  - a. Text, b. Tables, c. Graphs d. Maps
- Computers & researcher

## **Unit IV: Interpretation and report writing**

**10 h**

- Meaning of interpretation
- Interpretation of data
  - Techniques of interpretation
  - Precautions in interpretation
- Report writing
  - Significance of report writing

- Types of research report
- Different steps in writing report
- Layout of the research report
- Precautions for writing research report

#### References:

1. Kotahri, C. R. (2004 II Edn): Research Methodology Methods and Techniques, New Age International Publishers, New Delhi.
2. Mishra, R. P. (1989): Research Methodology A Hand Book, Concept Publishing Co., New Delhi.
3. Nayak, J. K. and Singh, Priyanka (2004 II Edn): Fundamentals of Research Methodology Problems and Prospectus, SSDN Publishers & Distributors, New Delhi.
4. Nicholas Walliman (2011): Research Methods the basics, Routledge Taylor and Francis Group, London & New York.
5. Pandey, Prabhat and Pandey, Meenu M. (2015): Research Methodology Tools and Techniques, Bridge Centre, Buzau, Romania.
6. Ranjit Kumar (2011 III Edn): Research Methodology A Step-by-Step Guide for Beginners, SAGE Publishers, Los Angeles, New Delhi.
7. Tiwari, R. N. and Shukla, D. P. (2003): Research Methodology, College Book Depot, Tripolia, Jaipur.

### **M.A/M.Sc (Geography) : Semester – IV**

### **GG-403: Practical in digital image processing**

Total Hours: 120

Credits: 4

#### **Course objectives:**

- To introduce the students to the basic concepts and principles of digital image processing.
- To study simple image processing techniques.
- To acquaint the knowledge of image rectification and classification techniques.

#### **Course outcomes:**

Student will be able to

- Examine various types of images, intensity transformations and spatial filtering.
- Evaluate the methodologies for image segmentation, restoration etc.
- Technically handle the GIS softwares.

#### **Unit I: Introduction digital image processing**

**20 h**

- Introduction to GIS software for digital image processing
- Search and download satellite data from web and data import to GIS software
- Introduction to satellite image

- Identification of low, medium and high-resolution satellite image
- Display of image and image statistics
- Visual interpretation of satellite image

**Unit II: Image enhancement**

**10 h**

- Image enhancement techniques: contrast enhancement, histogram equalizer, band ratioing and edge enhancement
- Image enhancement using convolution filter

**Unit III: Image rectification**

**15 h**

- Image enhancement techniques
- Georeferencing and project the toposheet
- Image to image registration
- Subset and mosaic the toposheet

**Unit IV: Image classification**

**15 h**

- Supervised classification
- Unsupervised classification
- Classification accuracy assessment

**References:**

1. ERDAS (2010): ERDAS field Guide, ERDAS incorporation, Norcross, GA, USA
2. [http://geospatial.intergraph.com/Libraries/Tech\\_Docs/Erdas\\_Field\\_Guide.sflb.ashx](http://geospatial.intergraph.com/Libraries/Tech_Docs/Erdas_Field_Guide.sflb.ashx)
3. Gupta, R. P. (2003): Remote Sensing Geology, Springer, Verlag Berlin
4. Richards, J. A, Jia,X.(1999):Remote Sensing and Digital Image Processing, Springer, Verlag Berlin
5. Cha, B., Dattaa, D., Majumdar (2001): Digital Image Processing Analysis, Prentice-Hall of India, NewDelhi
6. Nag, P. Kudrat, M. (1998): Digital Remote Sensing, Concept Publishing Company, New Delhi
7. Jensen, J. R. (2005): Introductory Digital Image Processing, Prentice Hall, New Jersey
8. Lillesand, T. M., Kiefer, R. W.Chipman, J. W.(2008): Remote Sensing and Image Interpretation, JohnWiley & Sons, New Delhi
9. Sabins, F. F. (1996): Remote Sensing: Principles an Interpretation, W. H. Freeman Company, New York

**M.A/M.Sc (Geography): Semester – IV**  
**GG-404: Project based on field visit**

**Total Hours: 120**

**Credits: 4**

**Course objectives:**

- To design the frame work of research problem.
- To learn the ways of collection of data.
- To learn to present the statistical data more effectively.

**Course outcomes:**

Student will be able to

- Find out the solutions of the problem.
- Develop the report writing skill of the student.
- Understand the various steps of research projects.

**Detailing of syllabus:**

<b>Sr. No.</b>	<b>Topic to be covered</b>
1	• Introduction
2	• Importance of research
3	• Selection of problem, observation
4	• Defining research problem
5	• Introduction of research problem.
6	• Aims and objectives
7	• Hypothesis
8	• Methodology literature review
9	• Primary (Field visit) and secondary database
10	• Analysis and Results
11	• Representation of database in the form of maps
12	• Conclusion and suggestions
13	• References
	<b>Report writing and presentation</b>

- ✓ Each student shall undertake a project based on Geography and Geoinformatics solutions to real world problems.
- ✓ Evaluation of project work shall be taken up at the end of the IV semester.
- ✓ Student has to submit project report in two hard copies before internal evaluation.
- ✓ Internal evaluation of project work will be through PowerPoint presentation by one of the faculty from department (except project guide).
- ✓ External evaluation of project work will be through PowerPoint presentation by external examiner.

# M.A/M.Sc (Geography): Semester – IV

## GG-405 (A): Disaster management

Total Hours: 60

Credits: 4

### Course objectives:

- To provide basic conceptual understanding of disasters and its relationships with management.
- To study the causes and remedies of disaster.
- To know the background of disaster.

### Course outcome:

Student will be able to

- Aware the students about concept of disaster.
- Study the origin of disasters.
- Understand the role of geographer in Disaster Management.

### Unit I: Fundamental concepts

15 h

- Definition and Concept of Disaster Hazard, Risk, Vulnerability
- Nature and Scope of Disaster Management
- Types of Disaster Management
- Importance of disaster Management

### Unit II: Types of disasters

15 h

- Natural disasters (nature, types causes and effects)
  - Hydrological disasters - flood, drought, and cloud burst
  - Geological disasters- earthquakes, tsunamis, landslides
  - Wind related- cyclone, storm,
- Man-made disasters (nature, types causes and effects)
  - Chemical disasters, biological disasters, radiological disasters, nuclear disasters.
  - Fire.

### Unit III: Preparedness & Mitigation

15 h

- Factors of disaster management
- First aid
- Role of civilians and NGO'S in natural calamities
- Home guard
- Role of Armed forces in natural calamities
- Role of Para-Military forces in natural calamities
- Role of Police forces in natural calamities
- Role of Geographers on Disaster Management

### Unit IV: Disaster Management

15 h

- Advanced Technologies for Warning System

- Definition of Early Warning System, Community Early Warning System, and Core Components of People centered Early Warning System
- Earthquakes
- Cyclones
- Plastic
- Accident

### References:

1. Turk J. (1985) : Introduction to Environmental Studies, Saunders, College Publication, Japan
2. Singh Savindra (2000) : Environmental Geography, Parag Pustak Bhavan, Allahabad
- Morrisawa M (Ed) (1994) : Geomorphology and Natural Hazards, Elsevier, Amsterdam
3. Hart M. G. (1986) : Geomorphology, Pure and Applied, George Allen and Unwin, London
- Valdiya K. S. (1987) : Environmental Geology, Tata McGraw Hill, New Delhi
4. Bryant Edward (2000) : Natural Hazards, Cambridge University Press
5. Disaster Management; Future challenges and opportunities, Editor: Jagbir Singh. K. International Publishing House Pvt. Ltd., New Delhi, Mumbai, Bangalore.
6. Concept and Practices in Disaster Management, Colonel (Retd.) P.P. Marathe, Diamond Publications, 1691, Sadashiv Peth, Near Grahakpeth, Pune 411030
7. Hand Book of Effective Disaster: Recovery, Planning, Mc Grow Hill Publ. ,London.
8. The Book of Natural Disaster: Alladin Books Ltd., London.
9. Disaster Management : Ed. Vinod Sharma, National Center for Disaster Management, Indian Institute of Public Administration, Indraprastha Estate, Ring Road New Delhi 110002.

## M.A/M.Sc (Geography): Semester – IV GG-405 (B): Geography of Tourism

**Total Hours: 60**

**Credits: 4**

### Course objectives:

- To understand the factors of tourism.
- To understand the concept and element of tourism geography.
- To study the geographical background of tourist centers.

### Course outcomes:

Student will be able to

- Understand the basics of geography of tourism.
- Getting job various fields of tourism.
- Start their own consultancy or tour and travel agency.

### Unit I: Introduction to geography of tourism

**15 h**

- Definition, nature, scope
- Role of geography in tourism.
- Tourism as an industry.
- Factors affecting on tourism.

- Relief, climate and vegetation
- Cultural
- Economics
- Historical
- Motivating factors for pilgrimages leisure and recreation

## **Unit II: Types of tourism**

**15 h**

- Cultural tourism
- Physical tourism
- Historical
- Adventure tourism
- Geo tourism
- Agro tourism
- Medico tourism
- National tourism
- International tourism
- Role of MICE (meetings, incentives, conventions and exhibitions) in tourism.

## **Unit III: Infrastructures and support systems**

**15 h**

- Accommodations
  - History of accommodation
  - Need of accommodation
  - Types of accommodation
  - Other supplementary accommodation
- Transportation
  - Indian railway
  - Airways
  - Roadways
- Hotel industries
  - Indian hotel industries

## **Unit IV: Impact of tourism**

**15 h**

- Positive and negative impact on
  - Physical factors
  - Cultural factors
  - Social factors
  - Economic factors
- Indian tourism policy
- Tourism and disaster management.
- Tourism planning and management

## **References:**

1. Bhatia, A.K. (1991) : International Tourism Fundamentals and Practices, SterlingPublishers Pvt. Ltd., New Delhi-110016
2. Bhatia, A.K. : Tourism Development, Sterling Publishers Pvt. Ltd., New Delhi-110016

3. Burkart and Medlik -Tourism, Past, Present and Future Heinemann, ELBS. (1981)
4. Cooper, Fletcher, Tourism, Principles and practices, Pitman. Publishing ,1993
5. Geetanjali (2010) : Tourism Policy and Planning, ABD Publishers, Jaipur
6. Kaul: Dynamics of Tourism, Sterling Publishers Pvt. Ltd., New Delhi-110016
7. Mill and Morrison (1992) : The Tourism system an Introductory Text , Prentice Hall
8. P.S. Gill: Dynamics of Tourism (4 Vols) Anmol Publication. New Delhi,
9. Wagh S.A. &Sonawane S.B. (2016) : Paryatan Bhugol, Atharva Prakashan, Jalgaon

## **M.A/M.Sc (Geography): Semester – IV**

### **GG-406(A): Geographical thoughts**

**Total Hours: 60**

**Credits: 4**

#### **Course objectives:**

- To acquaint the students with the philosophy of different thoughts.
- To learn the changes occurred in thoughts during course of time.
- To develop critical thinking and analytical approach.

#### **Course outcomes:**

Student will be able to

- Study recent trends in geographical thoughts.
- Learn the historical background of various geographical thoughts.
- Understand the stages of development of geographical thoughts according to time.

#### **Unit I: Development of geographical thoughts in Ancient period &Medieval period 20 h**

- Introduction
- Ancient Period:
  - Greek Contribution
  - Roman Contribution
  - Indian Contribution
- Medieval Period
  - Arab Contribution
  - Age of Discovery

#### **Unit II: Development of geographical thoughts in modern period 10 h**

- Introduction
- German Contribution
- French Contribution
- American Contribution

#### **Unit III: Dualism and conceptual development 15 h**

- Introduction



- Dualism in geography
  - Environmentalism versus possibilism
  - General vs regional geography
  - Physical vs human geography
- Conceptual development in geography
  - Areal differentiation
  - Spatial organization
  - Models in geography
  - Remote sensing & GIS applications

#### **Unit IV: Approaches**

**15 h**

- Systematic approach
- Regional approach
- Quantitative approach
- Behavioral approach
- Radical approach

#### **References:**

1. Husain Majid (2015 – 6th edition) : Evolution of Geographical Thought, Rawat Publication, Jaipur.
2. Harvey M. E. (2016). Themes in Geographic Thought, Rawat Publication, Jaipur.
3. LalitaRana (2015). Geographical Thoughts- Systematic Record of Evolution, Concept Publishing Company, New Delhi – 110059.
4. Peet R. (2011) : Modern Geographical Thought, Wiley Publishers.
5. Saroj K. Pal : Statistical Techniques (1982). A Basic Approach to Geography. McGraw Hill Publishing Co. Ltd, New York.

### **M.A/M.Sc (Geography) : Semester – IV Gg-406 (B): Watershed management and planning**

**Total Hours: 60**

**Credits: 4**

#### **Course objectives:**

- To understand the concept of watershed.
- To understand the importance of sustainable development of watershed programs.
- To know the applications of RS and GIS in watershed management.

#### **Course outcomes:**

Student will be able to

- Learn concept of watershed management and planning.
- Understand the various techniques of watershed management and planning.
- Learn the use of RS and GIS in watershed management

### **Unit I: Introduction to watershed**

**15 h**

- Concept of watershed, characteristic of watershed and classification of watershed.
- Significance of watershed development.
- Demarcation of watershed
- Types of watershed according to area and shape.

### **Unit II: Physical parameters of watershed**

**20 h**

- Channel geometry & basin morphology:
  - Hydraulic geometry at channel cross section & along the channel.
  - Channel cross section pattern.
  - Channel types.
- Basin morphology:
  - Drainage network & watershed boundary.
  - Drainage frequency, drainage density & constant of channel maintenance.
  - Basin morphology.
    - ✓ Horton's form factor.
    - ✓ Millar's circularity ratio.
    - ✓ Schumm's elongation ratio.
    - ✓ Strahler's ruggedness index.
    - ✓ Strahler's hypsometric integral.
- Landuse:
  - Measurement & data sources.
  - Land use and land cover:
    - ✓ Total geographical area.
    - ✓ Classification of land net sown, residential, fallow, forest, waste/desert.
- Terrain analysis: terrain analysis on the basis of –
  - Relief characteristics.
  - Slope.
  - Dissection index.
  - Drainage characteristics: spatial distribution of drainage frequency and drainage density.
  - Soil

### **Unit III: Hydrological parameters**

**15 h**

- Rainfall:
  - Intensity & duration
  - Measurements
- Aerial precipitation:
  - Thiessen polygons
  - Isohytal method
- Evaporation & transpiration:
  - Methods
  - Instruments
- Infiltration:
  - Methods,
  - instruments
- Run off:

- Measurement,
- Selection, criteria of gouging station.
- Discharge:
  - Measurements,
  - Unit hydrograph.

#### **Unit IV: Sample of watershed management and planning**

**10 h**

- Types of Survey for Watershed Development
  - Physical Survey
  - Hydrological
  - Land Use
  - Survey of Resources
- Advance techniques for watershed development
  - Remote sensing data analysis
  - Application of RS and GIS in watershed management.

#### **References:**

- Murthy J.V.S. (1994) : Watershed Management in India, Wiley Eastern Ltd. New Delhi.
- Paranjape S. and Other (1980) : Water based Development, Bharat GyanVigyanSamithi, New Delhi.
- Mutreja K.N. (1990) : Applied Hydrology, Tata McGraw Hill Pub. Co. Ltd. New Delhi.
- Shing R.J. (2000) : Watershed planning and Management, Yash Publishing House, Bikaner.
- ChandaB. ,Dattaa D., Mujumdar (2001) : Digital Image Processing and Analysis, Prentice-Hall of India.
- Prithvish Nag and M. Kudrat (1998) : Digital Remote Sensing , Concept Publishing Co. New Delhi-
- BasudebBhatta: Remote Sensing and GIS, 2nd ed., Oxford University press, Printed by- Radha press, New Delhi.
- M. Anji Reddy: Text book of Remote Sensing and GIS, 3rd Ed., BS Publications, Hydrabad.

**Teaching Methods:**

Discussion, analysis and feedback, discussion and problem solving, classroom teaching, lecture methods, project methods, question answer methods, assignment methods.

**Innovating teaching:**

Group discussion, project based learning, ICT enable teaching, video clips, movies, mobile apps, field trips, science quiz, models.

**Skill imparted:**

The curriculum is designed to give the applied knowledge to students. To develop technically educated human resources through subject like geoinformatics, digital image processing and remote sensing. To make aware the students about our natural resources through subject like geography of resource management, disaster management and watershed management & planning are designed. To impart theoretical and practical knowledge about origin and management of various disasters to students. The topics like interpretation of aerial photographs and satellite imageries, digital image processing and interpretation of SOI maps enhance the Student's theoretical and practical skill. Practical courses are based on theory courses and are designed to improve research oriented skills of students.

**Job opportunities:**

The designed curriculum offers job opportunities in various sectors like,

- Agriculture and forest department
- Road and land survey
- As cartographer in map making departments
- Soil and water conservations
- Tourism industry
- Research leading to Ph.D. degree
- Teaching field
- Self entrepreneurship