

**SRI VENKATESWARA UNIVERSITY - TIRUPATI**

**Subject: GEOGRAPHY**

**SEMESTER – IV – W.E.F. 2024-25**

**(MINOR)**

**FUNDAMENTALS OF REMOTE SENSING AND GIS**

**Course Objective**

- ✓ To provide knowledge on history and evolution of Remote sensing.
- ✓ To provide knowledge on the platforms and sensors and instruments used for remote sensing.
- ✓ To understand the evolution of GIS.
- ✓ To explain the types of data collection with respect to time and terrain and Data base management and retrieving the data from different sources.

**Course Outcomes**

After the completion of the course, Students will be able to

- ✓ Develop knowledge on history and evolution of remote sensing.
- ✓ Understand knowledge on the platforms and sensors and instruments used for remote sensing Understand the evolution of GIS.
- ✓ Focus on collection, analysing, interpretation and resending the data related to Earth.
- ✓ Differentiate the types of data collection with respect to time and terrain and Database management and retrieving the data from different sources

**UNIT-I**

Introduction to Remote Sensing: History, Development and Principles  
Stages in Remote sensing Process. Stages in Remote Sensing Process.

**Unit-II**

Energy Sources and Radiation Principles - Energy Interaction in the Atmosphere. Atmospheric Windows. Energy Interaction with Earth Surface features. Electromagnetic Spectrum. Spectral reflectance patterns of Earth surface features in different wavelength.

**UNIT-III**

Characteristics of Indian Remote Sensing Satellites (I.R.S), LANDSAT, etc.  
Principles of Image Interpretation: Elements of Image Interpretation, Digital Image Processing. Applications in Land use Land Cover Mapping and Urbanisation.

## **UNIT-IV**

GIS : Definitions and Development –Computer Components of GIS (Hardware and Software) – General Data Base concepts of Spatial and Non-spatial data - Elements of Spatial data- Sources of Spatial data– Data quality for GIS – Errors and Error variations in GIS.

## **UNIT-V**

GIS Data Management: Data Base Management Systems (DBMS) Data Base Models. Data input methods – Spatial Data structures : Raster data and Vector data – Structures –GIS Data Analysis : Spatial measurement methods Reclassification – Buffering – Overlay Analysis.

## **REFERENCES:**

1. Lillisand T.M and Keifer R.W, (1994), Remote Sensing and Image Interpretation, Jhon Willey & sons, New York.
2. Rampall, K.K. (1999), hand book of Aerial Photography and Interpretation, Concept Publishing Co., New Delhi.
3. Sabins, F.F. Jr, (1987), Remote Sensing; Principles and Interpretation, W.h. Freeman & Co., New York.
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5. LRA Narayanan, Remote sensing and its Applications, (1999), Universities Press (India) Ltd., Hyderabad.
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9. BurroughP.A.PrinciplesofGeographicInformationSystemsforLandResource Assessment.OxfordUniversityPress,NewYork,1986.
10. FraserTaylorD.R.GeographicInformationSystem.PergamonPress,Oxford, 1991.
11. MaquireD.J.M.F.GoodchildandD.W.Rhind(eds.)GeographicInformationSystems:PrinciplesandApplication.Taylor&Francis,Washington,1991.
12. Mark S.Monmonier. Computer –assisted Cartography. Prentice – Hall, Englewood Cliff, New Jersey, 1982.
13. PeuquetD.J.andD.F.Marble,IntroductoryReadinginGeographicInformation Systems.Taylor &Francis,Washington,1990.
14. StarJ.AndJEstes. Geographic Information Systems : An Introduction. Prentice Hall, Englewood, Cliff, NewJersey,1994.

## **PRACTICAL**

### **VISUAL IMAGE INTERPRETATION AND GIS DATA MANAGEMENT**

#### **Course objectives:**

- ✓ To explain practical knowledge on Remote sensing applications.
- ✓ To help to understand Visual and digital interpretation of satellite Images.
- ✓ To illustrate interpretation of Aerial photos.
- ✓ To acquaint knowledge on allocation of RS in different fields and sectors.

#### **Course Outcomes:**

After the completion of the course, Students will be able to

- ✓ Explain practical knowledge on Remote sensing applications.
- ✓ Understand Visual and digital interpretation of satellite Images.
- ✓ Illustrate interpretation of Aerial photos.
- ✓ Acquaint knowledge on allocation of RS in different fields and sectors.

Ex: 1 Techniques of Visual Interpretation.

Ex: 2 Marginal Information of Satellite Imageries.

Ex: 3 Visual Interpretation of Water Resources and

Lineaments, Ex: 4 Visual Interpretation of  
Landforms–Waste Land

Ex: 5 Visual Interpretation of Land use / Land cover and change detection

#### **REFERENCES:**

1. Curran,Paul,J.:Principles ofRemoteSensing:Longman,London,1985.
2. GautamN.C.etal.SpaceTechnologyandGeography;  
NationalRemoteSensingAgency,Hyder abad,1994.
3. ThomasM.Lillesandand Ralph, W.Keffer; Remote Sensing and  
imagesinterpretation, JohnWilley&Sons, NewYork,1994.

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**(MINOR)**

**REGIONAL GEOGRAPHY OF INDIA**

**Course objectives:**

- ✓ To conceptualize the regional approaches and to examine regional differentiation in the study of Indian Geography.
- ✓ To expose to historical, economic, cultural, social and physical characteristics of India.
- ✓ To provide an introduction to the regions of the India in terms of both their uniqueness and similarities.

**Course Outcomes**

After the completion of the course, Students will be able to

- ✓ Developed the art of regionalization technique while focusing about diversity of Indian region.
- ✓ Visualized and recognized about regional identities and socio-cultural dimension of regionalization to address the issues and concern needed for regional planning.

**UNIT – I:**

Major Physiographic divisions. Himalayas, Great Plains, Plateaus, Coastal Plains and islands

**UNIT - II**

Major and Minor River Systems and their drainage pattern. Climate: Temperature and Rainfall. Trewartha's Climatic Regions of India.

**UNIT-III:**

Soils: Types, Characteristics and Distribution. Forest types and distribution and economic significance. Agriculture: Irrigation and Power projects. Major Food grain crops: Rice and Wheat. Major commercial Crops: Sugarcane and Cotton. Plantation Crops: Coffee and Tea. Animal Husbandry

**UNIT-IV:**

Mineral Resources: Coal, Iron ore, Petroleum and Natural gas. Locational pattern of Industrial Activity. Weber's theory of industrial location. Major Industries: Iron and Steel, Cotton textiles and Ship Building. Industrial Regions of India and their characteristics.

**UNIT-V:**

Population: Distribution, Density, Growth and problems. Urban and Rural Population – Distribution and Trends. Development and patterns of Transport Networks (railways, waterways, airways and pipelines).

**REFERENCES:**

1. Spate, O.H.K. and Learmonth, A.T.A. (1972): India and Pakistan, B.I. Publication, Madras.
2. Sharma and Coutino (1980): Economic and Commercial Geography of India, Vikas Publications, New Delhi.
3. Singh, R.L. (1976): Regional Geography of India, National Geographical Society of India, Banaras.
4. Memoria, C.B. (1970): India's Population Problems, KitabMahal, Allahabad.
5. Wadia, D.N. (1961): Geography of India, Mc.Millan, London.
6. Tirtha, Geography of India, 2<sup>nd</sup> Edition
7. Chaudhuri, Development Regional Planning

# **PRACTICAL**

## **MAP PROJECTIONS**

### **Course Objective**

- ✓ To apprise the students about the art and science of map making and representation.
- ✓ To explain the usage of different types of projections.
- ✓ To focus on the importance of scale and projection in the process of representing the earth surface.

### **Course Outcomes:**

After the completion of the course, Students will be able to

- ✓ Explain the concept of map, scale and projection.
- ✓ Student can explain the purpose of projection.
- ✓ The main outcome of this course is students can able to select different projection for different geographical areas.

Ex: 1 Maps and scales-types, Conversion of Scales, Introduction to Map projections; Choice of Map Projection and UTM.

Ex: 2 Conical Projections: One Standard Parallel, Two Standard Parallel; Bonne's and Polyconic

Ex: 3 Zenithal Polar Projections: Stereographic and Gnomonic

Ex: 4 Cylindrical Projections: Equi-Distant, Equal Area and Mercator, Ex:

5 International map projection: Sinusoidal and Mollweide projection.

### **References:**

1. Khan, Z.A.: Text book of practical geography: concept; New Delhi, 1998.
2. Misra, R.P. and Ramesh, A.: Fundamentals of Cartography, Concept, New Delhi, 1989.
3. Singh, R.L.: Map work and practical geography; central book depot; Allahabad, 1972.
4. Steers, J.A.: Map projections, University of London Press, London.