**20CEXXO1 –REMOTE SENSING**

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| **Course Category** | Open Elective | **Credits** | 3 |
| **Course Type** | Theory | **Lecture - Tutorial - Practical** | 3 - 0 - 0 |
| **Prerequisite** | None | **Sessional Evaluation** | 40 |
| **Semester End Exam Evaluation** | 60 |
| **Total Marks** | 100 |

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| **Course Outcomes** | CO1 | Understand remote sensing terms and concepts of the physical applications of such a system. |
| CO2 | Understand the different technical aspects of a remote sensing network with special emphasis on India remote sensing technology. |
| CO3 | Compare different types of data obtained from a remote sensing network with tools specifically designed for the purpose. |
| CO4 | Understand about various methods of corrections applied to data to ensure maximum credibility and accountability to the data collected. |
| CO5 | Apply remote sensing in agriculture and forest resources management. |
| CO6 | Apply remote sensing in Land use/Land cover and coastal zone management. |
| **Course**  **Content** | **UNIT – I**  **BASIC CONCEPTS OF REMOTE SENSING:**Definition of Remote Sensing; History of Remote Sensing and Indian Space Program;Remote Sensing Process;Source of energy – Concept of energy, Electromagnetic radiation, Electromagnetic Spectrum; Interaction of electromagnetic radiation with atmosphere, Vegetation, soil and water – Absorption, Scattering, Refraction, Reflection;Spectral Reflectance Curve; Atmospheric windows; Advantages and Limitations of Remote Sensing.  **UNIT – II**  **REMOTE SENSING SYSTEM:**Introduction; Types of Remote Sensing -Classification Based on Platform, Energy Source, Imaging Media, Regions of Electromagnetic Spectrum, Number of Bands; Characteristics of Images; Orbital Characteristics of Satellite; Remote Sensing Satellites; Definitions – Swath, Nadir, path, row, Orbital calendar.  **SENSORS CHARACTERISITICS:** Sensor Resolutions- Spatial Resolution, Spectral Resolution, Radiometric Resolution, Temporal Resolution  **UNIT – III**  **VISUAL IMAGE INTERPRETATION:**Introduction; Information Extraction by Human and Computer; Remote Sensing Data Products; Image Interpretation; Elements of Visual Image Interpretation -Location, Size, Shape, Shadow, Tone, Colour, Texture, Pattern, Height and Depth, Site, Situation, and Association; Interpretation Keys  **UNIT – IV**  **DIGITAL IMAGE PROCESSING:**Introduction; Categorization of Image Processing; Image Processing Systems; Data Formats of Digital Image; Pre-processing - Radiometric Correction of Remotely Sensed Data, Geometric Correction of Remotely Sensed Data, Miscellaneous Pre-processing; Image Enhancement - Image Reduction, Image Magnification, Colour Compositing, Transect Extraction, Contrast Enhancement; Filtering;  **UNIT – V**  **APPLICATIONS OF REMOTE SENSING FOR EARTH RESOURCES MANAGEMENT – I :**Agriculture – crop production forecasting, agricultural drought assessment, precision farming; Forestry – Type and density mapping, forest cover change, forest status in India;  **UNIT – VI**  **APPLICATIONS OF REMOTE SENSING FOR EARTH RESOURCES MANAGEMENT – II:**  Land cover/Land use mapping – Wastelands, Urban sprawl; Water Resources; Coastal Zone Management – Coastal zone ecosystem, Coastal regulation zone, integrated coastal zone management. | |
| **Textbooks**  **and**  **References** | **TEXTBOOKS:**   1. Bhatta B, *Remote sensing and GIS*, Oxford University Press, 3rd edition, 2021. 2. George Joseph, C Jeganathan, *Fundamentals of remote sensing*, Universities Press, 3nd Edition, 2018. 3. TsurgCharg, *Introduction to Geographic information system,* Tata McGraw Hill Education Private Limited. 2nd edition, 2014.   **REFERENCES:**   1. John R.Jensen, *Remote sensing of the environment– An earth resources perspective,* Pearson Education,2ndedition, 2014. 2. Peter ABurragh and Rachael McDonnnell,*Principals of Geo physical Information system*, Oxford Publications 2nd edition, 2004. 3. A. Kumar, *Basics of remote sensing & GIS,* Laxmi publications, 3rd edition, 2009. | |

**CO-PO Mapping:**3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| **CO1** | 1 | - | - | 2 | - | - | - | - | - | - | - | 1 | - | - | - |
| **CO2** | - | 2 | 2 | - | - | - | 1 | - | - | 2 |  | 2 | 1 | 1 | 1 |
| **CO3** | 2 | - | 1 | - | 1 | - | 1 | - | - | - | - | - | 2 | 1 | 1 |
| **CO4** | - | 1 | - | 1 | - | - | - | - | - | 1 | - | - | 2 | 1 | 1 |
| **CO5** | 2 | - | 1 | - | 1 | - | - | - | - | - | - | 1 | 2 | 1 | 1 |
| **CO6** | 2 | 1 | - | 2 | - | - | 2 | - | - | 2 | - | 1 | 2 | 1 | 1 |