APPLICATIONS OF REMOTE SENSING AND GIS

Paper Code: ETCE-304	**L**	**T/P**	**C**
Paper: Applications of Remote Sensing and GIS	**3**	**0**	**3**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Objective: To understand the principles of remote sensing and digital image processing, GIS, such as assessment of cyclone, rainfall, atmospheric humidity etc., and Gain experience in the use of image processing and GIS software.

UNIT I
Introduction, concepts and physical basis of Remote Sensing, Electromagnetic spectrum, radiation laws, atmospheric effects, image characteristics.
Remote sensing systems; sources of remote sensing information, spectral quantities spectral signatures and characteristics spectral reflectance curves for rocks, soil, vegetation and water.
Introduction to Aerial and space borne platforms.
Global positioning system (GPS) photogrammetry – analog, analytical and digital photogrammetry, height and plan metric.
                                                                [T1][No. of Hours 11]

UNIT II
Optical, thermal and microwave sensors and   their resolution, salient features of some of operating Remote Sensing satellites,
Digital image processing; introduction, image rectification and restoration, image enhancement, manipulation, image classification, fusion.
                                                           [T1,T2][No. of Hours 11]

UNIT III
GIS system : Definition terminology and data types, Map projection and Co-ordinate system, basic components of GIS software, data models, data acquisition, both raster based and vector based data input and data processing and management including topology, overlaying and integration and finally data product and report generation, principle of cartography and cartographic design.
GIS customization concepts, approaches of Multi-criteria decision making, concepts and applications of Geostatistics.
                                                                [T1][No. of hours 12]

UNIT IV
Application of Geo-spatial technology in Civil Engineering, assessment of cyclones, rainfall, atmospheric humidity etc., weather analysis, forecasting and modelling.Land use, inventory and monitoring, urban planning, snow and glaciers, coastal zone management, air and water pollution, commercially available remote sensing and GIS software.
                                                                [T2][No. of hours 11]

Text Books:
[T1]   Chang K.T., "Introduction to Geographic Information System", Tata McGraw Hill Education (P) Ltd.,
[T2]   John R.Jensen, "Remote Sensing of the Environment", Pearson Education

Reference Books:
[R1]   Clarke K.C., Parks B.O., Crane M.P., "GIS and Environmental Modelimg", PHI Learning (P) Ltd., ND
[R2]   Lillesand T.M. and Kiefer R.W, "Remote Sensing and Image Interpretation", John Wiley and Sons, NY
[R3]   Lo C.P. and Yeung A.K.W., "Concept and Techniques of Geographic Information Systems", PHI
[R4]   Chakraborty D. and Sahoo R.N., "Fundamentals of Geographic Information System", Viva Books, ND.
[R5]   Joseph G., "Fundamentals of Remote Sensing", University Press (India) Ltd., Hyderabad.
[R6]   L.R.A. Narayan, "Remote Sensing and its Applications", University Press.