EV804 OPTICAL REMOTE SENSING AND PHOTOGRAMMETRY 4-0-0-4

Unit I Introduction to Remote Sensing

Introduction of Remote Sensing ,Electro Magnetic Spectrum - Effects of Atmosphere-Scattering – Absorption-Atmospheric window- Energy interaction with surface features – Spectral reflectance of earth objects and land covers – Resolution concepts – types – Satellites, orbits and missions. Introduction to Geoinformatics, basic concepts, components tools & techniques, Geo-dectical aspects

Unit II Data Acquisition in Different Platforms

Historical development – Opto- mechanical electro optical sensors – across track and Along track scanners – multi spectral scanners – characteristics of different types of platforms – medium and high resolution missions – Future Missions - Data products and characteristics – formats

Unit III Data Analysis

Sources of Errors – scene, sensor and atmospheric causes - correction: geometric and Radiometric – visual and digital interpretation- elements of interpretation – interpretation keys - digital analysis and classification – image formation, visualization : Image enhancement, filters– Baye' theorem - Image classification: unsupervised and supervised – thematic mapping - accuracy assessment.

Unit IV Introduction to Photogrammetry Principles – aerial photo-aerial camera -Scale – overlaps – stereoscopy – concepts – viewing and measuring systems – image and object co-ordinates – transformation - floating mark – parallax equation – height information - Flight planning – computation for flight plan – photo control

Unit V Photogrammetry and Mapping

Concepts of interior, relative, absolute orientation – direct geo referencing – object, image relation - collinearity and co planarity conditions – effect of orientation elements - Elements and principles of Aero triangulation – ortho rectification - ortho mosaic - Introduction to digital photogrammetry- - comparison with analytical systems - DP workstations.

Unit VI Data Output and Web Based GIS

Map Compilation – Cartographic functionalities for Map Design – Symbolization – Conventional signs and symbols - Meta Data – Web based GIS: Definition, Merits - Architecture – Map Server – Case Studies - Open Source GIS – Import and Export of spatial data. GNSSs –basic principles, types of receivers, processing methods, accuracy measurements, GPS signal characteristics, data formats, various GNSSs in the world- GPS, GLONASS, IRNSS, Augmentation systems, GAGAN, mobile mapping

TEXT BOOKS/ REFERENCES:

1. Robert A. Schowengerdt, Remote Sensing,: Models and Methods for Image Processing, Third Edition, Academic Press, 2007, ISBN-13: 978-0123694072

2. Gottfried Konecny, Geoinformation: RS, Photogrammetry and Geographic Information Systems, Second Edition, CRC; 2nd edition, 2009. ISBN 0 - 415 23795 – 7.

3. Paul R.Wolf, Elements of Photogrammetry, McGraw-Hill Science, 2001, ISBN 0070713464, 9780070713468

4. Karl Kraus, Photogrammetry, Fundamentals and standard processes, Dümmler, 2000, ISBN 978 3 11019007 6

5. W.G.Rees, Physical principles of remote sensing, second edition, Cambridge University Press, 2001, ISBN 0 - 521 66034 3.

6. Emilio Chuvieco; Alfredo Huete; Fundamental of Satellite Remote Sensing, December 2009, CRC Press

7. Edward M. Mikhail, James S. Bethel, J. Chris Mc Glone; Introduction to Modern Photogrammetry, 2001, John Wiley & Sons Inc