REMOTE SENSING ESSENTIALS

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TYPE OF COURSE : New | Elective | UG/PG
COURSE DURATION : 12 weeks (27 Jan’ 20 - 17 Apr’ 20)
EXAM DATE : 26 Apr 2020

PRE-REQUISITES : Remote Sensing / Geoinformatics companies, e.g NIIT, ESRI India, Leica
Geoinformatics, MapmyIndia etc

INTENDED AUDIENCE : Under- / Post-graduate engineering and post graduate science students / PhD candidates

INDUSTRIES APPLICABLE TO : ONGC, OIL, GSI and others

COURSE OUTLINE :
The proposed course provides basic understanding about satellite based Remote Sensing and Digital Image Processing technologies. Presently, remote sensing datasets available from various earth orbiting satellites are being used extensively in various domains including in civil engineering, water resources, earth sciences, transportation engineering, navigation etc. Google Earth has further made access to high spatial resolution remote sensing data available to non-experts with great ease. Knowledge of Digital Image Processing of satellite data allows to process raw satellite images for various applications.

ABOUT INSTRUCTOR :
Dr. Arun K. Saraf is Ph. D. (Remote Sensing) from University of Dundee, United Kingdom. Presently he is working as Professor in the Department of Earth Sciences, Indian Institute of Technology, Roorkee, and teaches courses on Remote Sensing, Digital Image Processing, Geographic Information Systems (GIS), Advanced GIS, Geomorphology, Geohydrology etc. to under- and post-graduate students of Geological Technology and Applied Geology. He was also Head of Department of Earth Sciences between Jan. 2012 – Feb. 2015. He was first in the country to introduce GIS course to post-graduate students.

COURSE PLAN :

Week 1: Rudiments of remote sensing and advantages, Historical Perspective of development of remote sensing technology
Week 2: Laws of Radiation and their relevance in Remote Sensing, Basis of remote sensing image representation
Week 3: Prominent characteristics of IRS, Cartosat, ResourceSat etc.
Week 4: Importance of digital image processing
Week 5: Atmospheric errors and corrections, Geometric transformations /Georeferencing Technique
Week 6: Digital Image Processing Software
Week 7: Supervised image classification techniques and limitations
Week 8: High Spatial Resolution Satellite Images and limitations
Week 9: NDVI and other indices, Image merging techniques, Radar Images interpretation and applications, SAR Interferometry (InSAR) Technique
Week 10: Remote Sensing integration with GIS and GPS
Week 11: Integrated applications of RS and GIS in groundwater studies
Week 12: Google Earth and its utilization, Integration of satellite images with Digital Elevation Models and generation of 3D perspective