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.

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:
Prof. 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: SAR Interferometry (InSAR) Technique-02, Principles of image interpretation.
Week 11: Integrated applications of RS and GIS in groundwater studies.
Week 12: Different sources of free satellite images, Limitations of Remote Sensing Techniques.