

**Course Contents:**

Altimetric LiDAR: Physics of laser, spectral characteristics of laser, laser interaction with objects; Airborne Altimetric LiDAR: principle: topographic and bathymetric LiDAR, multiple return, full wave digitization; Components of a LiDAR system, INS technology, INSGPS integration, measurement of laser range, calibration; Flight planning; LiDAR geo-location models; Accuracy of various components of LiDAR and error propagation, error analysis of data and error removal; Data classification techniques, raw data to bald earth DEM processing, uses of return intensity and full waveform in information extraction, LiDAR data integration with spectral data; LiDAR applications: building, tree, powerline extraction; LiDAR data visualization; Photogrammetry: metric and non-metric cameras; Geometry of near vertical and tilted photographs, heights and tilt distortions; Rectification and ortho-photographs; Stereoscopy, parallax equation and stereo measurements for height determination; Orientation interior, exterior, relative, and absolute, Mathematical model relating image, model and object space; Collinearity and coplanarity conditions, DLT; Image matching techniques; Strip and block triangulation and adjustment; Automatic DTM and Ortho-photo production.