

**INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

**NAME OF DEPARTMENT/CENTRE/SCHOOL: Civil Engineering**

**Subject Code:** CEC-511

**Course Title:** - Surveying Measurements and Adjustments

**L-T-P:** 3-0-2

**Credit:** 4

**Subject Area:** PCC

**Course Outlines:** Maps and their scales, Surveying principles, measuring equipment and techniques, Leveling, Traversing, Triangulation, Trilateration, Modern surveying equipment, Concept of observation and model, Errors, Model adjustments

**INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

**NAME OF DEPARTMENT/CENTRE/SCHOOL: Civil Engineering**

**Subject Code:** CEC-513

**Course Title:** - Principles of Photogrammetry

**L-T-P:** 3-0-2

**Credit:** 4

**Subject Area:** PCC

Course Outlines: Types of photograph, Scale determination, Flying height, Relief and Tilt Displacements, Stereovision, Flight planning, Concept of orientation, Methods of relative orientation, Residual errors and precision of orientation, Stereo-plotting instruments, Close-range photogrammetry

**INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

**NAME OF DEPARTMENT/CENTRE/SCHOOL: Civil Engineering**

**Subject Code:** CEC-515

**Course Title:** - Principles of Remote Sensing

**L-T-P:** 2-0-2

**Credit:** 3

**Subject Area:** PCC

**Course Outlines:** Energy sources and radiation principles, Interaction of EMR with atmosphere and earth surface, Radiation Calculations, Visual image interpretation, Multispectral, Thermal, Hyperspectral and Microwave Sensing, Platforms and Sensors

**INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

**NAME OF DEPARTMENT/CENTRE/SCHOOL: Civil Engineering**

**Subject Code:** CEC-517

**Course Title:** - Geodesy and GNSS Surveying

**L-T-P:** 2-0-2

**Credit:** 3

**Subject Area:** PCC

**Course Outlines:** Geodesy and its development, Size, shape and motion of Earth, Earth and its gravity field, Earth's atmosphere and its gravitational field, GNSS and its components, GNSS Instrumentation, data collection and processing, GNSS observables, Errors in GNSS data

**INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

**NAME OF DEPARTMENT/CENTRE/SCHOOL: Civil Engineering**

**Subject Code:** CEC-519

**Course Title:** - Field Survey Camp\*

**L-T-P:** 2-0-0

**Credit:** 2

**Subject Area:** PCC

**Course Outlines:** 14 days of survey fieldwork, GPS surveying, Total station surveying, Drone surveying, Geospatial data collection, Topographic mapping