

1.	Title of the course	Surveying
2.	Course number	CE209M
3.	Structure of credits (L-T-P-C)	2-0-3-4
4.	New course/modification to	Modified with CE203L/SURVEYING
5.	To be offered by	Civil and Environmental Engineering
6.	Proposed by	Avadh Bihari Narayan
7.	Prerequisite	None
8.	<b>Course Objective(s):</b> To introduce the concepts of surveying techniques and develop a comprehensive understanding of positioning, mapping, planning and setting out.	
9.	<b>Course Content:</b> Introduction; Plane surveying; Distance measurements: conventions and methods, measurements using tape, electronic distance measurement (EDM); Directions: meridians, azimuths and bearings, declination computations, conventional and advanced methods of angle measurement, theodolites, electronic theodolites, tacheometric surveying; Traverse: methods of adjustments, areas by coordinates; Triangulation and trilateration; Levelling: concept and terminology, field methods of leveling, contouring; Adjustment of survey observations; Mapping: coordinate systems, map projections, map preparation using geographic information system (GIS); Construction surveys: introduction, setting out of curve for road construction, building citing, setting out of building foundation; Earthwork: area computation, volume computation, applications; Introduction to advanced geodetic surveying: global navigation satellite systems (GNSS), light detection and ranging (LiDAR), inertial navigation system (INS), remote sensing.	
10.	<b>Textbook(s):</b> 1. Arora K R, Surveying, 17th Edition, Standard Book House, New Delhi (2019). 2. Pradip K G, Remote Sensing for the Beginner, 3rd Edition, East-West Press, New Delhi (2013).	
11.	<b>Reference(s):</b> 1. Schofield W and Breach M, Engineering Surveying, 6th Edition, Spon Press, London (2007). 2. Subramanian R, Surveying and Levelling, 2nd Edition, Oxford University Press, New Delhi (2012).	