

**INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI**  
**PROFORMA FOR NEW COURSE**

1.	Title of the Course	Geotechnical Investigations and Foundation Design
2.	Course Number	CE5027
3.	Status of the Course	Elective
4.	Structure of Credits	3-0-0-3
5.	Offered To	PG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Civil & Environmental Engineering
8.	To take effect from	July 2019
9.	Prerequisite	CoT
10.	Whether approved by the Department	Yes
11.	<b>Course Objective:</b> This course describes different methods of subsoil investigation, drilling, and sample collection in soils and rock deposits. This course also describes the applications of the principles of soil mechanics to analyse and design shallow and deep foundations. Upon completion of this course, the student will be able to plan an appropriate geotechnical investigation program and design of a suitable foundation for different loading conditions including compressive, uplift and lateral forces.	
12.	<b>Course Content:</b> Site Investigation: stages of site investigation, codal provisions; Drilling methods in soils and rocks; Sampling techniques in soils and rocks; Laboratory tests and interpretation; Field tests: SPT, DCPT, SCPT, in-situ vane shear test, pressuremeter test, dilatometer test; Geophysical methods; Shallow Foundations: types, design considerations, codal provisions; Bearing capacity of soils and rocks from field and laboratory tests, total and differential settlements; Pile foundations: types of piles, construction methods, codal provisions; Axial capacity of single pile and pile groups; Settlement of single piles and pile groups; Uplift capacity, lateral load capacity, and negative skin friction of piles and pile groups.	
13.	Text book(s): 1. Bowles J, <i>Foundation Analysis and Design</i> , McGrawHill (2008). 2. Clayton R, Mathews C M and Simons N E, <i>Site Investigation</i> , Wiley Blacwell (1995).	
14.	Reference(s): 1. Kurian N P, <i>Design of Foundation Systems - Principles and Practices</i> , Narosa Publishing House (1994). 2. Murthy V N S, <i>Advanced Foundation Engineering</i> , CBS Publishers (2007). 3. Salgado R, <i>The Engineering of Foundations</i> , McGraw-Hill Education (2006). 4. Tomlinson M and Woodward J, <i>Pile Design and Construction Practice</i> , Taylors & Francis (2008).	