INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	Ground Improvement and Geosynthetics
2.	Course Number	CE5206
3.	Status of the Course	Core
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	Nil
10.	Whether approved by the Department	Yes
11.	**Course Objective:** This course describes the basic concepts of different ground improvement techniques for varied subsoil types and profiles. This course also describes the fundamental aspects of geosynthetics and their applications in infrastructure development including foundations, embankments, reservoirs, pavements, airfields and waste containment facilities. Upon completion of this course, the student will be able to design appropriate ground improvement for a given soil condition, type of structure and type of loading.	
12.	**Course Content:** Principles of compaction; Shallow stabilization with additives: lime, flyash and cement; Deep stabilization: stone column, sand drains, prefabricated drains, lime column, soil-lime column, vibro-floatation, dynamic compaction, electro-osmosis; Grouting: permeation, compaction and jet; Dewatering systems; Geosynthetics: types and functions, materials and manufacturing processes, testing and evaluation; Reinforced soil structures: principles of soil reinforcement, application of geotextiles and geogrids in roads, walls, and embankments; Application of geotextiles, geonets and geocomposites as drains and filters; Multiple functions: railways and overlay design; Geosynthetics in environmental control: covers and liners for landfills – material aspects and stability considerations.	
13.	Text book(s): 1. Hausmann M R, *Engineering Principles of Ground Modification,* McGraw Hill (2013). 2. Koerner R M, *Designing with Geosynthetics,* Prentice Hall (2005).	
14.	Reference(s): 1. Colins J F P J, *Earth Reinforcement and Soil Structures,* Thomas Telford (1996). 2. Jie H, *Principles and Practice of Ground Improvement,* John Wiley & Sons (2015). 3. Shukla S K, *Geosynthetics and their Applications,* Thomas Telford (2002). 4. Xanthakos P P, Abramson L W and Bruce D A, *Ground Control and Improvement,* John Wiley & Sons (1994).	