

INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	Strength of Materials
2.	Course Number	ME2103
3.	Status of the Course	Core
4.	Structure of Credits	2-1-2-4
5.	Offered To	UG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Mechanical Engineering
8.	To take effect from	July 2018
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	Course Objective: Understanding the concept of force equilibrium, stress, strain and the relation between the quantities. Learning the analysis of members subjected to flexure (beams), torsion (shear) and compression (columns). Also learning the methods to compute deflection which are necessary for analysis of indeterminate systems.	
12.	Course Content: Equilibrium of forces, Deformable bodies, State of stress and strain, Transformation - Mohr circle, Principal stresses and strains, plane stress and strain, Stress- strain relation, Thermal strains, Thick and thin walled cylinders, Pressure vessel, Bending of beams- bending Moment and shear force diagrams, normal and shear stresses, Bending equation, Deflection due to bending - double integration method, McCaulay's method, Method of superposition, Energy method - Castigliano's theorem, Shear center, Shear flow, Torsion - circular shafts, Combined stresses, Strain energy due to axial deformations, bending and torsion, failure theories, stability - buckling of columns, Euler buckling load, short and long columns	
13.	Text book(s): 1. Crandall S H, Dahl N C and Lardner T J, <i>An Introduction to the Mechanics of Solids</i> , 3rd Edition, McGraw-Hill Publishing Company (2012).	
14.	Reference(s): 1. Gere J M and Timoshenko S P, <i>Mechanics of Materials</i> , 2nd Edition, CBS Publishers (2004).	