

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

1.	Title of the Course	Mechanical Operations
2.	Course Number	CH2202
3.	Status of the Course	Core
4.	Structure of Credits	2-1-3-5
5.	Offered To	UG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Chemical Engineering
8.	To take effect from	July 2018
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	Course Objective: To provide a fundamental understanding about the role of particulate matter in chemical engineering unit operations and processes. An overview of the physical mechanisms involved, principles of size reduction, particle dynamics and separation would be discussed. To comprehend the practical aspects of the lecture materials, hands-on experiences are covered in the laboratory.	
12.	Course Content: Particle size analysis; Storage of solids; Size reduction and related equipment operation; Particle mechanics; Mechanical separations – screening, filtration, sedimentation, flow through packed beds, fluidization and fluid-solid conveying. Laboratory: Particle size distribution (sieve analysis and ball mill); Measurement of specific surface area of particles, wet and dry methods: Blaine's apparatus and solution densitometry; Settling of particles and measurements of fluid viscosity and density; Sedimentation of particulate slurry; Hammer mill, jaw crusher, roll crusher; Cyclone separator; Centrifuge; Magnetic separator; Plate and frame filter; Rotary drum vacuum filter; Vibrating screen and Elutriator.	
13.	Text book(s): 1. McCabe W L, Smith J C and Harriot P, <i>Unit Operations of Chemical Engineering, 6th Edition</i> , McGraw Hill (2001). 2. Rhodes M J, <i>Introduction to Particle Technology, 2nd Edition</i> , Wiley Blackwell (2008).	
14.	Reference(s): 1. Coulson J M and Richardson J F, <i>Chemical Engineering Volume 2</i> , Butter worth Heinemann (2001). 2. Green D, <i>Perry's Chemical Engineer's Hand Book, 9th Edition</i> , McGraw Hill (2018).	