

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

1.	Title of the Course	Machining Processes
2.	Course Number	ME3103
3.	Status of the Course	Core
4.	Structure of Credits	3-0-3-5
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.	<b>Course Objective:</b> This course is designed to enable the student to explain the constructional details and functions of basic components of lathe, shaper, planer, drilling, milling and grinding machines and estimate machining times, suggest appropriate cutting fluids, cutting tool materials and tool geometry for given operating conditions, develop computer numerical control programs to produce required parts, suggest appropriate advanced machining process for a given application.	
12.	<b>Course Content:</b> Machine tools: Types, parts, working, machining time estimation; Principles of machining: Tool geometry, orthogonal and oblique cutting, mechanics of chip formation, Merchant's analysis, dynamometry, effect of tool geometry on cutting forces and surface finish, tool materials, thermal aspects in machining, cutting fluids, tool wear and tool life, machinability, machining economics, sustainable machining, multi-point machining, abrasive machining; Introduction to computer numerical control (CNC) machining: Constructional features of various machine tools, CNC programming; Advanced machining processes: Basic principles, features of mechanical, thermo-mechanical, thermo-electrical, chemical, thermo-chemical and hybrid processes, process variables; Lab component: Programming and machining on CNC turning centre, CNC milling machine, wire-electric discharge machining, measurement of cutting forces and temperature, grinding.	
13.	Text book(s): 1. Kalpakjian S and Schmid S R, <i>Manufacturing Engineering and Technology</i> , 4th Edition, Pearson (2013). 2. Koren Y, <i>Computer control of manufacturing systems</i> , 1st Edition, Tata McGraw Hill Education (2009).	
14.	Reference(s): 1. Chowdary S K, <i>Elements of Workshop Technology, Vol. II</i> , 1st Edition, Media Publishers & Promoters, India (2010). 2. Jain V K, <i>Advanced Machining Processes</i> , 1st Edition, Allied Publishers Pvt. Ltd. (2007). 3. Rao P N, <i>Manufacturing Technology Volume – 2: Metal Cutting and Machine Tools</i> , 3rd Edition, Tata McGraw Hill (2009). 4. Rao P N, <i>CAD / CAM Principles and Applications</i> , 3rd Edition, McGraw Hill Education (2017).	