

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

1.	Title of the Course	Advanced Mechanical Engineering Laboratory 2
2.	Course Number	ME5292
3.	Status of the Course	Core
4.	Structure of Credits	0-0-3-2
5.	Offered To	PG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Mechanical Engineering
8.	To take effect from	January 2019
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	<b>Course Objective:</b> To fabricate parts using CNC machines, wire-EDM and CMT process; apply reverse engineering concepts to fabricate parts using additive manufacturing process; measure the quality of machined parts for their dimensional, geometrical and surface roughness requirements; perform setup a model in a commercial finite element software and perform static analysis, buckling analysis, modal analysis, transient analysis	
12.	<b>Course Content:</b> 1. Part-programming and CNC turning 2. Part-programming and CNC milling 3. Wire electric discharging machining of difficult-to-cut materials 4. Effect of process parameters on weld bead quality in CMT process 5. Reverse engineering of end-user part using 3D scanning and additive manufacturing 6. Part quality inspection using CMM and Surface roughness tester for machined parts 7. Static analysis of a connecting rod 8. Bucking analysis of slender beams 9. Modal analysis of an automotive chassis 10. Transient analysis of a wind turbine blade subjected to wind load	
13.	Text book(s): 1. Yoram Koren, <i>Computer control of manufacturing systems</i> , Tata McGraw Hill Education, (2009). 2. T.R. Chandrupatla , A.D. Belegundu, <i>Introduction to Finite Elements in Engineering</i> , Prentice-Hall, (1997).	
14.	Reference(s): 1. Cook, Malkus, Plesha, <i>Concepts and applications of Finite element analysis</i> , John Wiley and Sons, (2003). 2. P. N. Rao, <i>Manufacturing Technology Vol – 2: Metal Cutting and Machine Tools</i> , Tata McGraw Hill , (2009). 3. K.J. Hume, <i>Engineering Metrology</i> , TBS The Book Service Ltd , (1970). 4. Daryl Logan, <i>A First Course in Finite Element Method</i> , Thomson, (2005).	