



INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI

भारतीय प्रौद्योगिकी संस्थान तिरुपति

Yerpedu-Venkatagiri Road, Yerpedu Post, Tirupati District, Andhra Pradesh - 517 619

1.	Title of the course	Makers Laboratory
2.	Course number	EA104P
3.	Structure of credits (L-T-P-C)	0-0-3-2
4.	New course/modification to	Modified with WS1010/WORKSHOP-I
5.	To be offered by	Mechanical Engineering
6.	Prerequisite	None
7.	Course Objective(s): To provide practical exposure to the students on converting raw materials into products and assembly using basic manufacturing processes. To expose them to the latest technologies in smart manufacturing.	
8.	Course Content: Basic machining - safety measures, cutting tool identification, basic turning and milling operations, Foundry demo and welding - safety in foundry, materials and tools, sand casting process demonstration, safety measures to be followed in arc welding, welding consumables and tools, shielded metal arc welding of butt and T-joints, Laser-assisted sheet metal fabrication - safety measures, training on open source laser cutting and engraving software interface, designing the profile model, laser cutting and assembling to produce a three-dimensional shape, 3D printing – safety measures, introduction to 3D printing, training on 3D printing software, 3D printing of an assembly from CAD model, Industry 4.0 demo - basics of pneumatics and hydraulics, linear and rotary actuators, demonstration of Industry 4.0 enabled modular manufacturing system, Product based exercise: manufacturing a functional product assembly.	
9.	Textbook(s): 1. Groover M P, Fundamentals of Modern Manufacturing: Materials, Processes, and Systems, 4th Edition, John Wiley & Sons (2010). 2. Groover M P, Automation, Production Systems, and Computer-Integrated Manufacturing, 4th Edition, Pearson Education (2016).	
10.	Reference(s): 1. Kalpakjian S and Schmid S R, Manufacturing Engineering and Technology, 4th Edition, Pearson Education (2013). 2. Askin R G and Strandridge C R, Modelling and Analysis of Manufacturing Systems, Wiley (1993).	