



MECHANICAL ENGINEERING

RAPID MANUFACTURING

PROF. JANAKRANJAN RAMKUMAR

Department of Mechanical Engineering
IIT Kanpur



TYPE OF COURSE	: Rerun Elective UG/PG
INTENDED AUDIENCE	: All Engineering and Science disciplines
COURSE DURATION	: 12 weeks (20 Jul 20 - 09 Oct 20)
EXAM DATE	: 17 Oct 2020
PRE-REQUISITES	: The student should have completed 2 semesters of UG Eng or Science

DR. AMANDEEP SINGH

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INDUSTRIES APPLICABLE TO : HAL, NAL, SAIL, ISRO

COURSE OUTLINE :

In the contemporary dynamic manufacturing era, to produce products that can be easily made and can offer typical competences is of utmost importance. Besides basic manufacturing processes, engineering students and manufacturers need to bolster their skills in advanced technologies. This course is a step in this direction to make the students learn design, development, and manufacturing using Rapid Manufacturing technologies. Along with specific Rapid Prototyping techniques, manufacturing concerns such as geometric modelling, design for manufacturing and assembly, developing modular designs, group technology, et cetera are included. Laboratory demonstrations are also induced for practical experience.

ABOUT INSTRUCTOR :

Dr. Janakranjan Ramkumar is Professor of Mechanical Engineering Department, and Design Program, at Indian Institute of Technology, Kanpur. He has worked for BOSCH group and improved the productivity of the company. His research and teaching focus is on nano technology and inclusive design. He has several international and national patents in his credit and has published more than 100 journal papers.

Dr. Amandeep Singh is working as a Project Scientist in the Mechanical Engineering Department, and Design Program at Indian Institute of Technology, Kanpur, India. He holds PhD degree from Indian Institute of Technology Kanpur, India, and a bachelor degree in Production Engineering. Dr. Singh has ten years of industrial and academic experience. His research interests are Sustainable Manufacturing Processes and Systems, Simulation of Manufacturing Systems, Product Design and Manufacturing, and Applied Ergonomics.

COURSE PLAN :

- Week 01** : Introduction to Rapid Manufacturing
- Week 02** : Feature based manufacturing
- Week 03** : Design for modularity
- Week 04** : Computer Integrated Manufacturing
- Week 05** : 3D measurements, laboratory demonstration
- Week 06** : Liquid based rapid manufacturing processes
- Week 07** : Powder based rapid manufacturing processes
- Week 08** : Solid based rapid manufacturing processes
- Week 09** : Product costing and selection of material
- Week 10** : Systems approach in rapid manufacturing
- Week 11** : Software demonstration on process simulation
- Week 12** : Green rapid manufacturing, market competitiveness