

5th Semester	RPL5D004	Additive Manufacturing	L-T-P 3-0-0	3 Credits
------------------------------------	-----------------	-----------------------------------	------------------------	----------------------

Module I: (10 Hours)

Introduction, Prototyping fundamentals, Historical development, Advantages of AMT, Commonly used terms, process chain, 3D modelling, Data Conversion, and transmission, Checking and preparing, Building, Post processing, RP data formats, Classification of AMT process, Applications to various fields

Module II: (10 Hours)

Liquid based systems: Stereo lithography apparatus (SLA): Models and specifications, process, working principle, photopolymers, photo polymerization, layering technology, laser and laser scanning, applications, advantages and disadvantages, case studies. Solid ground curing (SGC): Models and specifications, process, working principle, applications, advantages and disadvantages, case studies.

Module III: (10Hours)

Solid based systems: Laminated object manufacturing (LOM): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies. Fused Deposition Modeling (FDM): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies, practical demonstration

Module IV: (10 Hours)

Powder Based Systems: Selective laser sintering (SLS): Models and specifications, process, working principle, applications, advantages and disadvantages, case studies. Three dimensional printing (3DP): Models and specification, process, working principle, applications, advantages and disadvantages, case studies.

Books:

- [1] Chua C.K., Leong K.F. and LIM C.S Rapid prototyping: Principles an Applications, World Scientific publications, 3rdEd., 2010
- [2] D.T. Pham and S.S. Dimov, “Rapid Manufacturing”, Springer, 2001
- [3] Terry Wohlers, “ Wholers Report 2000”, Wohlers Associates, 2000
- [4] Paul F. Jacobs, “ Rapid Prototyping and Manufacturing”–, ASME Press, 1996
- [5] Ian Gibson, Davin Rosen, Brent Stucker “Additive Manufacturing Technologies, Springer, 2nd Ed, 2014.

Digital Learning Resources:Course Name:Rapid Manufacturing

Course Link:<https://nptel.ac.in/courses/112/104/112104265/>

Course Instructor:**Dr. Amandeep Singh**

Prof. J. Ramkumar, IIT Kanpur