

5th Semester	RPR5D005	Tool Design	L-T-P 3-0-0	3 Credits
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Module I:**(10 Hours)**

Product design considerations, product planning, product development, value analysis, product specification. Role of computer in product design. Product design for sand casting: design of gating system and risering, Design of single point cutting tools, tool strength and rigidity calculation, selection of tool angles, chip breakers, carbide tipped tools, High production cutting tools.

Module II:**(12 Hours)**

Cutting process in broaching, Geometric elements of broach teeth, Design of internal & external surface broach, Calculation of no. of teeth, Rigidity, Cutting force, Power. Forging design: allowances die design for drop forging, design of flash and gutter, upset forging die design.

Module III:**(12 Hours)**

Sheet metal working: Design consideration for shearing, blanking piercing, deep drawing operation, Die design for sheet metal operations, progressive and compound die, strippers, stops, strip layout.

Module IV:**(10 Hours)**

Design of jigs and fixtures, principle of location and clamping, clamping methods, locating methods, Drill Jig bushing, Indexing type drilling Jig. Design of single point cutting tool, broach and form tool. Design of limit gauges.

Process Planning- Selection of processes, machines and tools. Design of sequence of operations, Time & cost estimation, Tooling design for turret lathe and automats.

Books:

1. Fundamentals of Tool Engineering design, S.K. Basu, S.N. Mukherjee, R. Mishra, Oxford & IBH Publishing co.
2. Manufacturing Technology, P.N. Rao , Tata McGraw Hill
3. A Textbook of Production Engineering, P.C. Sharma, S. Chand & Co
4. Product Design & Manufacturing, A K Chitale, R C Gupta, Eastern Economy Edition, PHI.
5. Product Design & Development, Karl T Ulrich, Steven D Eppinger, Anita Goyal, Mc Graw Hill
6. Technology of Machine Tools, Krar, Gill, Smid, Tata Mc Graw Hill
7. Jigs & Fixture Design, Edwrd G Hoffman, Cengae Learning.