5th Semester	RPR5C003	Manufacturing Technology- II	L-T-P 3-0-0	3 Credits

Module I: **(10 Hours)**

Geometry of cutting tools in ASA and ORS, Effect of Geometrical parameters on cutting force and surface finish, Mechanism of chip formation, Merchant's Theory, Force relationship and velocity relationship, Types of Tool Wear: Flank wear, Crater wear, Wear measurement, Effect of variables on tool life and surface finish, Measurement of cutting force, Lathe tool dynamometer, Drill tool dynamometer. Economics of machining.

Module II: **(10 Hours)**

Conventional machining process and machine tools - Turning, Drilling, Shaping, Planning, Milling, Grinding. Machine tools used for these processes, their specifications and various techniques used. Principles of machine tools : Kinematics of machine tools, speed transmission from motor to spindle , speed reversal mechanism, mechanism for feed motion, Tool holding and job holding methods in different Machine tools, Types of surface generated, Indexing mechanism and thread cutting mechanism, Quick return mechanism.

Module III: **(8 Hours)**

Production Machine tools - Capstan and turret lathes, single spindle and multi spindle semiautomatics, Gear shaper and Gear hobbing machines, Copying lathe and transfer machine.

Module IV: **(6 Hours)**

Cutting Tool Materials & Cutting Fluids: Characteristics of tool materials, various types of cutting tool materials, coated tools, cutting tool selection, Purpose and types of cutting fluids, basic actions of cutting fluids, effect of cutting fluid on tool life, selections of cutting fluid, Cutting fluid and its effect; Machinability Criteria, Tool life and Taylor's equation.

Module V: **(6 Hours)**

Non-traditional Machining processes:
Ultrasonic Machining, Laser Beam Machining, Plasma Arc Machining, Electro Chemical Machining, Electro Discharge Machining, Wire EDM , Abrasive Jet Machining..

Books:

[1] Metal Cutting Principles, M.C.Shaw, Oxford University Press
[2] Fundamentals of Machining and Machine Tools, G.Boothroyd and W.A.Knight, CRC Press
[3] Metal Cutting Theory and Practice, A.Bhattacharya, Central Book Publishers
[4] Manufacturing Technology by P.N.Rao, Tata McGraw Hill publication
[5] Manufacturing Science, Ghosh and Mallik, East West Press.
[6] Modern Manufacturing Processes, P.C.Pandey, H.S.Shan, Tata McGraw Hill
[7] Machining Technology; Machine Tools and Operation, H.A.Youssef and H. El-Hofy, CRC Press

Digital Learning Resources:

Course Name:	Mechanics of Machining
Course Link:	https://nptel.ac.in/courses/112/103/112103248/
Course Instructor:	Dr.Uday S. Dixit IIT Guwahati