RTM Nagpur University
Syllabus (Theory)

Semester	Course Title (Subject)	Hours / Week			Credits	Maximum Marks			Exam Duration (Hrs.)
		L	T	P		Continual Assessment	University Examination	Total	
IV	**Machining Processes**	03	00	00	03	30	70	100	03

Sr. No.	Course Objective The objective of this course is–
1	Understand basic mechanism of metal removal processes.
2	Working mechanisms of variousmachinetoolsandmachiningprinciples.
3	To know surface finishing and allied processes.
4	Understand the importance of machining processes and be able to apply the suitable machining processes for an engineering product.

Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Understand fundamentals of metal cutting
CO2	Understand basic construction and operations of lathe shaping, planning
CO3	Understand basics of milling and milling cutters. slotting
CO4	To know about the surface finishing processes.
CO5	Understand the basic of drilling, boring, reaming and broaching.

SYLLABUS	
Contents	No of hours
Unit I **Introduction to Machining Parameters**: Introduction to machining, Tool materials, nomenclature andtoolgeometryofsinglepointcuttingtool,toolmaterialsproperties,classification,HSS,carbide tool, coated tools, diamond coatedtool. Theory of Metal Cutting: Introduction. Orthogonal and Oblique cutting. Mechanics of Metal Cutting. Merchant's circle, Chip formation, cutting force calculations, cutting fluids, cutting speed, feed and depth of cut on power requirement, Estimation of tool life.	09
Unit II Lathe: Introduction, types, construction of simple lathe, mechanism and attachments for various operations,machinespecifications,basisforselectionofcuttingspeed,feedanddepthofcut,time estimationforturningoperationssuchasfacing,stepturning,taperturning,threading,knurling. Introduction to Capstan, Turret Lathe and fundamentals of NC. **Shaper:** Introduction, types, specification, description of machines, cutting parameters. Mechanism of shaper: Quick return mechanism, Crank & slotted link mechanism, Table feed mechanism, attachments for shaper, work holding devices, shaper operations. **Planer:** Introduction, specifications,description,typesofplanner,opensideplanner,pitplannerMechanismforplanner: Drivingmechanism,feedingmechanism,plannercuttingtools,cuttingparameters.	10
Unit III **Milling:** Introduction. Specification, types, column &knee type milling machine, fixed bed type milling machines, production milling machines, special purpose milling machines such as thread milling Machines, profile milling machine, Gear Milling. Hobbing machines. Mechanisms & AttachmentsforMilling,Cuttingparameters,Typesofmillingoperations,Typesofmillingcutters , Toolgeometry&theirspecifications.Indexing - simple,compound anddifferential. **Slotter:** Introduction, specifications, description, type of drives for slotter, types of slotting machines -production slotter, puncher slotter, tool room slotter, slotter tools.	09
Unit IV **Grinding**: Operations, grinding wheel, specifications & selection, cylindrical & centreless grinding operation, surface grinding, tool & cutter grinding, time estimation for grinding operations. **Super finishing process:** Honing, Lapping, super finishing, polishing, buffing, 'metal spraying, galvanizing and electroplating. Process parameters and attainable grades of surface finish, surface measurement.	09

Unit V **Drilling:** introduction, tools for drilling, classification of drills, twist drills, drill size and specifications, tipped drills, type of drilling machines-portable drilling machine. bench drilling machine, right drilling machine, radial drilling machine, universal drilling machine, multisided drillingmachine.Drillingmachinesoperations,timeestimationfordrilling. **Reaming:**Introduction, description of reamer, type of reaming operations. **Boring:** Introduction, types of boring machine, horizontalboringmachine,verticalboringmachine,jigmachine,microboring.boringoperations. **Broaching:**Introduction,typeofbroaches,nomenclatureofbroaches.typesofbroachingmachines.	09

Sr. No.	List of Tutorials
01	Based on above syllabus

References:

Text Books Recommended:

1. Workshoptechnology(Vol.II),V.S.Raghuwanshi,DhanpatRai&Sons
2. Manufacturing Science, Ghosh & Mallik, East WestPress
3. Manufacturingtechnology(Metalcutting&Machinetools)Vol.II,P.N.Rao,Tata Mc-GrawHill
4. Workshop technology, H. S. Bawa, Tata Mc-GrawHill
5. IntroductiontoManufacturingProcesses,J.A.Schey,TataMc-GrawHill
6. Workshop Technology (Volume II), Hajra Chaudhary, Media Promoters & Publishers

Reference Books Recommended:

1. ManufacturingEngineering&Technology,S.Kalpakjian&S.R.Schmid
2. Technology of Machine Tools, Krar &Oswald
3. Manufacturing Processes, M.Begman
4. Processes & Materials of Manufacture, R.Lindberg
5. Production Technology, HMT

RTM Nagpur University
Syllabus (Practical)

Semester	Course Title(Subject)	Hours / Week			Credits	Maximum Marks		
		L	T	P		Continual Assessment	University Examination	Total
IV	Machining Processes	00	00	02	01	25	25	50

Course Outcomes	
After successful completion of this course the student will be able to:	
CO1	Understand basic cutting tools.
CO2	Working of lathe and turning operation
CO3	Shaping and planning operation
CO4	Milling and drilling operation
CO5	Grinding and surface finishing

List of Practical's

Minimum Eight out of following shall be performed:

Sr. No.	List of Practical's
01	Study of Single Point CuttingTool.
02	Studyof Various forces on single point cutting tools.
03	Study of multiple point cutting tools (milling,drilling)
04	Study of LatheMachine.
05	Study of Shapermechanisms.
06	Study of milling machine
07	One Job onMilling.
08	One Job on Drilling,Boring
09	One Job on Thread Cutting, TaperTurning.
10	One Job on SurfaceGrinding.

Suggested References:

1. ManufacturingEngineering&Technology,S.Kalpakjian&S.R.Schmid
2. Technology of Machine Tools, Krar &Oswald
3. Manufacturing Processes, M.Begman
4. Processes & Materials of Manufacture, R.LindbergProduction Technology, HMT