

### III Year: Fifth Semester

CODE: AE301 Title: Manufacturing technology										
L	T	P	Credit	Area		CWS	PRS	MTE	ETE	PRE
3	0	2	4	DCC		15	25	20	40	-

**Objectives:** To introduce student with various types of conventional machines, unconventional machines, theory of metal cutting, design of tools and methods of measurement

<b>Syllabus</b>		<b>Contact Hours</b>
<b>Unit-1</b> <b>Conventional Machining:</b> General Principles (With Schematic Diagrams only) of Working, Types and Commonly Performed Operations in the Following Machines - Lathe, Shaper, Planer, Milling Machine, Drilling Machine, Grinding Machine, Gear Cutting - Basic of CNC Machine.		7
<b>Unit-2</b> <b>Unconventional Machining Processes:</b> Need for Unconventional Machining Processes – Non-conventional machining: Studies on basic principle, working and effects of process parameters of the following processes: Ultrasonic machining (USM), Abrasive jet machining (AJM), Electro-discharge machining (EDM), Electrochemical machining (ECM), Electron beam machining (EBM), Plasma arc machining (PAM) and Laser beam machining (LBM). Ion Beam Machining (IBM), Biochemical Machining		7
<b>Unit-3</b> <b>Theory of Metal Cutting:</b> Mechanics of metal cutting- Orthogonal and oblique cutting, Chip formation, Types of chips, Chip control, Merchants theory of cutting forces at tool point, Limitations and modifications of Merchants theory, Plowing forces and the ‘Size effect’, Heat generation in metal cutting, Cutting fluids and their physical action, Tool wear, Tool life and Machinability, Nomenclature of cutting tools and Cutting tool materials, Economics of machining, Analysis of milling and grinding processes.		7
<b>Unit-4</b> <b>Design Features of Machine Tools:</b> Design requirements of machine tools, Kinematic drives of machine tools, Types of machine tool drives, Design of machine tool spindle.		7
<b>Unit-5</b> <b>Jigs &amp; Fixtures:</b> Important considerations in jigs and fixture design. Main principles of designing of jigs & fixtures. Different devices and methods of locations. Different types of clamps used in jigs & fixtures.		8
<b>Unit-6</b> <b>Metrology:</b> Introduction to Metrology and its relevance, Linear and angular measurements.		6
<b>Total</b>		42

<b>Reference Books:</b>	
1	HajraChoudury, "Elements of Workshop Technology", Vol. I and Vol. II, Asia Publishing House, 1996. (ISBN-13-9788185099149)
2	B S Raghuwanshi, "Production Technology" Vol. 1,2 (ISBN-4567144376)
3	P N Rao "Manufacturing Technology", Vol.1, Tata McGraw Hill, 2003. (ISBN9781259062575) 4 )
4	Sharma P.C., "A Text Book of Production Engineering", Vol.1, S. Chand Publication, New Delhi, 2001. (ISBN-9788121901116)
5	Geoffrey Boothroyd, "Fundamentals of Machining & Machine Tools" Winston A. Knight, Marcel & Dekker Publications. (ISBN-10:1574446592)

### Course Outcomes

CO1	To study the construction and working of conventional manufacturing machines And analyze its parameters
CO2	To study the construction and working of unconventional manufacturing machines. And analyze its parameters
CO3	To study and analyse metal cutting types and their complete analysis in term of quality ,cost and time required.
CO4	To study about different drives ,spindle of machine tool.
CO5	To study about jig and fixtures for different applications
CO6	To study concept of measurement and its types.

### CO-PO/PSOMatrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	0	0	0	0	0	0	2	2	1	1
CO2	3	3	2	3	1	0	0	0	0	0	0	1	2	1	1
CO3	3	3	3	3	1	0	0	0	0	0	0	2	3	3	2
CO4	3	3	3	3	1	0	0	0	0	0	0	1	3	3	2
CO5	2	2	2	2	2	0	0	0	0	0	0	1	2	2	2