SRM University, Kattankulathur-603203
Faculty of Engineering and Technology
SCHOOL OF MECHANICAL ENGINEERING
Department of Mechanical Engineering

SRM UNIVERSITY
(Under Section 3 of UGC Act 1956

Course Plan

Course Code : ME1008
Course Title : Manufacturing Technology
Semester : IV
Academic year / Semester : 2014 – 15 / EVEN (Jan2015 – May2015)

Sec.	Class Room	Faculty Details			
		Name	Staff Room No.	E-mail ID @ktr.srmuniv.ac.in/ Contact Number	Student Contact Time
		Mr. S.Shakthivel	H315	shakthivel.s/9444779054	12:30-1:30 p.m
		Mr.S.Baladhandayuthapani	MEB208/D	balathandayuthapani.p /9994390844	12:30-1:30 p.m
		Mr.K.Sankar	H502	sankar.k / 9894597507	12:30-1:30 p.m
		Mr. S.Sasikumar	H502	sasikumar.s/ 7639160837	12:30-1:30 p.m
		Mr. S.ArunKumar	AB102	arunkumar.si /9962034059	12:30-1:30 p.m
		Mr. R. Saravanakumar	MEB208/D	saravanakumar.r	12:30-1:30 p.m

Continuous Assessment Details

Name of Assessment*	Mark	Topics	Tentative Date	Duration (min)
Cycle Test I	10	Unit –I – Casting(Full) , Unit –II – Up to forging	9th February	100
Surprise / Assignment	05	Extrusion and Blanking	Last week of February	20
Cycle Test II	10	Unit-II From Wire drawing to Types of dies Unit-III – Up to Tool Signature	9th March	100
Model Exam	20	All Topics	15th April	180
End Semester	50	All Topics	May	180
Attendance	05			

Expected Learning Outcome

		L	T	P	C
ME10 08	MANUFACTURING TECHNOLOGY	3	0	0	3
	Prerequisite				
	Nil				

Student outcomes	Program Educational Objectives The main objective of the B.Tech in Mechanical Engineering Program is to provide a periodically-updated curriculum so that, following the completion of the program and with a few years of experience, our alumni will have the expertise to:			
	1. Practice mechanical engineering in disciplines towards system design, realization, and manufacturing.	2. Enhance professional practice to meet standards with ethical and social responsibility.	3. Solve industrial, social, and problems with appropriate techniques and tools.	4. Work in large cross-functional teams and learning.
(a) an ability to apply knowledge of mathematics, science, and engineering	X		X	
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	X	X	X	

Course designed by		Department of Mechanical Engineering										
1	Student outcome	a	b	c	d	e	f	g	h	i	j	K
		×		×								
2	Mapping of instructional Objectives with student outcome	1-6		1-6								

3	Category	GENERAL (G)	BASIC SCIENCES (B)	ENGINEERING SCIENCES AND TECHNICAL ART (E)	PROFESSIONAL SUBJECTS (P)
				X	

3	Broad area (for professional courses only, i.e 'under P' category)	Manufacturing	Design	Thermal	Genaral
		X			

4	Course Coordinator	Mr S.Shakthivel

ME1008 - MANUFACTURING TECHNOLOGY

PURPOSE

To make the students aware of different manufacturing processes like casting, metal forming, metal cutting and gear manufacturing.

INSTRUCTIONAL OBJECTIVES

1. Concepts of casting Technology.
2. Mechanical working of metals.
3. Theory of metal cutting.
4. Gear manufacturing process.
5. Surface finishing processes.
6. Milling machine & other machine tools.

UNIT I – CASTING **(8 Hours)**

Introduction to casting - Patterns - Types - Pattern materials - Allowances. Moulding - types - Moulding sand - Gating and Risering - Core making. Special Casting Process – Shell- Investment - Die casting - Centrifugal Casting – Design of Casting, defects in casting.

UNIT II - MECHANICAL WORKING OF METALS **(9 hours)**

Hot and Cold Working: Rolling, Forging, Wire Drawing, Extrusion - types – Forward-backward and tube extrusion. **Sheet Metal Operations:** Blanking - blank size calculation, draw ratio, drawing force, Piercing, Punching, Trimming, Stretch forming, Shearing, Bending – simple problems - Bending force calculation, Tube forming - Embossing and coining, Types of dies: Progressive, compound and combination dies, defects in forming.

UNIT III - THEORY OF METAL CUTTING **(9 hours)**

Orthogonal and oblique cutting - Classification of cutting tools: single, multipoint - Tool signature for single point cutting tool - Mechanics of orthogonal cutting - Force relations: Merchant circle – Determination of Shear angle - Chip formation- Cutting tool materials - Tool wear and tool life - Machinability - Cutting Fluids - Simple problems.

UNIT IV - GEAR MANUFACTURING AND SURFACE FINISHING PROCESS **(9 hours)**

Gear manufacturing processes: Extrusion, Stamping, and Powder Metallurgy. Gear Machining: Forming. Gear generating process - Gear shaping, Gear hobbing. Surface Finishing Process: Grinding process, various types of grinding machine, Grinding Wheel - types - Selection of Cutting speed and work speed, dressing and truing. Fine Finishing - Lapping, Buffing, Honing, and Super finishing.

UNIT V - MACHINE TOOLS **(10 hours)**

Milling Machine - Types, Types of cutters, operations, Indexing methods. Shaping, Planing and Slotting Machine – Operations and quick return mechanisms, Work and tool holding devices. Boring machine - Operations, Jig boring machine. Broaching machine - operations, Tool nomenclature-Simple Problems.

TOTAL: 45

TEXT BOOKS

1. Sharma.P.C, "Production Technology : Manufacturing Processes", 7th Edition, S. Chand Publisher, 2008.
2. Rao.P.N, "Manufacturing Technology, Vol I and II", Tata McGraw Hill Publishing Co., 2nd edition, 2009.

REFERENCES

1. Hajra Choudhary.S.K and Hajra Choudhary.A.K, "Elements of Manufacturing Technology", Vol II, Media Publishers, Bombay, 2007.
2. Jain.R.K, "Production Technology : Manufacturing Processes, Technology and Automation", 17th Edition, Khanna Publishers, 2011.
3. Kalpakjian, "Manufacturing Engineering and Technology", 4th edition, Addison Wesley Congmen Pvt. Ltd., Singapore, 2009.
4. Chapman.W.A.J, "Workshop Technology Vol. I and II", Arnold Publisher, New Delhi, 2001

Session

~~COURSE~~ PLAN

S.No	Period	Title	Ref. Book	Chapter Nos
		CASTING		
1	1	Introduction to Casting , Patterns- types and Materials	T1	Ch-03
2	1	Pattern Allowances, Moulding - types,		
3	1	Moulding sand ,Gating and Risering		
4	1	Cores &Core making		
5	1	Special casting - Shell casting, Investment Casting		
6	1	Die casting - Hot chamber, Cold chamber		
7	1	Centrifugal Casting.		
8	1	Design of Casting, Defects in Casting		
		MECHANICAL WORKING OF METALS		
9	1	Introduction to Hot and Cold Working	T1	Ch-04
10	1	Rolling - Hot and Cold , Type - Two, three, four, multi and Universal		
11	1	Forging- Open die and Closed die forging ,Wire drawing.		
12	1	Extrusion- Hot, Cold ,Forward ,backward and tube extrusion		
13	1	Blanking-blanking size calculation		
14	1	Drawing ratio-Drawing force, Piercing, Punching, Trimming Stretch forming, and Shearing.		
15	1	Bending- simple problems- Bending force calculation		
16	1	Tube forming - Embossing and coining		
17	1	Types of dies: Progressive, compound and combination dies, defects in forming.		
		THEORY OF METAL CUTTING		
18	1	Orthogonal and oblique cutting	T1	Ch-06
19	1	Classification of cutting tools: single point, multipoint		
20	1	Tool signature for single point cutting tool		
21	1	Mechanics of orthogonal cutting-Force relationship	T2	Ch-01
22	1	Merchant Circle –Simple problems		
23	1	Shear angle and its significance		
24	1	Chip formation	T1	Ch-06
25	1	Cutting tool materials		
26	1	Tool wear and tool life - Machinability		
27	1	Cutting Fluids		

	GEAR MANUFACTURING AND SURFACE FINISHING PROCESS			
28	1	Gear Manufacturing - Extrusion, Stamping and Powder Metallurgy	T2	Ch-09
29	1	Gear Machining - Forming - Spur and Helical in milling Machine		
30	1	Gear Generating - Gear shaping, Gear hobbing		
31	1	Types of Grinding machines-Surface G.machines		
32	1	Cylindrical and Center-less grinding machines		
33	1	Grinding wheel - Types, specification		
34	1	Selection of Cutting speed and work speed- Dressing and Truing.		
35	1	Fine Finishing - Lapping, Buffing		
36	1	Fine Finishing - Honing, and Super finishing		
		MACHINE TOOLS		
37	1	Milling Machine - General purpose, Special purpose	T1	Ch-08
38	1	Types of cutters (Arbor, Shank mounted)		
39	1	Operations(up and down, peripheral, face milling) & Indexing methods(Simple and Differential) - simple problems		
40	1	Shaping, Slotting Machine - description, Operations,		
41	1	Planing (Double house and open side) ,Quick return mechanism		
42	1	Work and tool holding Devices		
43	1	Boring machine - Specification, operations, Jig boring machine		
44	1	Broaching machine- Specification, Types, operations(internal, surface)		
45	1	Tool nomenclature of broaching tool		

TOTAL:45

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4.Chapman.W.A.J, "Workshop Technology Vol. 1 and II", Arnold Publisher, New Delhi, 2001

S.No	Sec	Teacher Name	Signature
1		Mr. S.Shakthivel	
2		Mr.S.Baladhandayuthapani	
3		Mr.K.Sankar	
4		Mr. S.Sasikumar	
5		Mr. S.ArunKumar	
6		Mr. R. Saravanakumar	

Course Co-ordinator

Prof. In-charge (II yr)