Faculty of Engineering and Technology SRM University, K attankulathur-6 03203

SCHOOL OF MECHANICAL ENGINEERING

Department of Mechanical Engineering

Course Plan

Course code : ME1008
Course Title : Manufacturing Technology
Semester : III
Academic year / semester : 2014 – 15 / ODD (Jun'14 – Nov' 14)

Sec.	Class Room	Faculty Details				
		Name	Staff Room No.	Inter com No.	E-mail ID @ktr.srmuniv.ac.in	Student Contact Time
G	UB807	Mr. R. Saravanakumar	MEB208/D		saravanakumar.r	D-2, 12.30 – 1.20
H	UB815	Mr. S.Sundar	MEB205	1826	sundar.s	D-1, 12.30 – 1.20
I	UB818	Mr.Vaddi Thulasikanth	MEB208/C		vaddithulasikanth.r	D-1, 12.30 – 1.20
J	UB819	Mr. K.Saknar	MEM32/B		sankar.k	D-1, 12.30 – 1.20
K	UB822	Mr. Muralidharan S	MEH109		muralidharan.s	D-1, 12.30 – 1.20
L	UB902	Mr. S.Shakthivel	MEH315		shakthivel.s	D-1, 12.30 – 1.20

Continuous Assessment Details

Name of Assessment	Mark	Topics	Tentative Date	Duration (min)
Cycle Test I	10	Ch. 1 and ch. II upto Forging	30-07-14	100
Surprise / Assignment	05	Ch I and Ch II		20
Cycle Test II	10	Ch II and Ch III upto cutting tool materials	25-08-14	100
Model Exam	20	All Topics	20-10-14	180
End Semester	50	All Topics		180
Attendance	05			

Expected Learning Outcome

		L	T	P	C
ME1008	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 different disciplines towards system design, realization, and manufacturing.	2. Enhance professional practice to meet the global standards with ethical and social responsibility.	3. Solve industrial, social, and environmental problems with appropriate techniques and tools.	4. Work in large cross-functional teams and pursue life-long 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 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. SUNDAR

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.

SRM UNIVERSITY
SCHOOL OF MECHANICAL ENGINEERING

Course Code: **ME1008** **COURSE / LESSON PLAN**

Course Title: **Manufacturing Technology**

Year / Semester: **II / 3rd** **YEAR: 2014-2015**

Branch: **MECHANICAL**

Sl. No.	Hr.	TITLE	Ref. Book	Chapter No.
		CASTING		
1	1	Introduction - Casting and Patterns, Pattern types and Materials	T1	Ch-03
2	1	Pattern Allowances; Moulding - types, Green Sand Moulding;		
3	1	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		
	8	**MECHANICAL WORKING OF METALS**		
10	1	Introduction to Hot and Cold Working	T1	Ch-04
11	1	Rolling - Hot and Cold , Type - Two, three, four, multi and Universal		
12	1	Forging- Open die and Closed die forging		
13	1	Wire drawing, Extrusion- Hot, Cold extrusion		
14	1	Blanking-blanking size calculation		
15	1	Drawing ratio-Drawing force, Piercing, Punching, Trimming Stretch forming, and Shearing.		
16	1	Bending- simple problems- Bending force calculation	T1	Ch-04
17	1	Tube forming - Embossing and coining		
18	1	Types of dies: Progressive, compound and combination dies, defects in forming.		
	9	**THEORY OF METAL CUTTING**		
19	1	Orthogonal and oblique cutting	T1	Ch-06
20		Classification of cutting tools: single point, multipoint		
21	1	Tool signature for single point cutting tool		
22	2	Mechanics of orthogonal cutting-Force relationship: Merchant Circle	T2	Ch-01
23		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	2	Cutting Fluids- Simple problems		
	9	**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	Grinding Machine - Cylindrical		
32	1	Grinding Machine - Surface, and Center-less		
33	1	Grinding wheel - Types, specification		
34	1	Dressing and Truing, Selection of Cutting speed and work speed		
35	1	Fine Finishing - Lapping, Buffing		
36	1	Fine Finishing - Honing, and Super finishing		
	9	**MACHINE TOOLS**		
37	1	Milling Machine - General purpose, Special purpose	T1	Ch-08
38	1	Types of cutters (Arbor, Shank mounted),simple problems		
39	2	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	Broaching machine- Tool nomenclature		

Text Book

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

Sl. No	Sec	Teacher Name	Signature
1	G	Mr. R. Saravanakumar	10/7/14
2	H	Mr. S.Sundar	
3	I	Mr.Vaddi Thulasikanth	10/7/14
4	J	Mr. K.Saknar	10/7/14
5	K	Mr. Muralidharan S	10/7/14
6	L	Mr. S.Shakthivel	

10/7/14

Course Coordinator **Prof. In-charge (II Yr)**