SCHEME OF COURSE WORK

Course Title	: Rapid prototyping			
Course Code	: 13ME2102	L T P C	: 4 0 0 3	
Program:	: M.Tech.			
Specialization:	: CAD/CAM			
Semester	: I			

Course Outcomes (COs):

At the end of the course, the student will be able to

1	Describe product development, conceptual design and classify rapid prototyping systems; explain stereo lithography process and applications
2	Explain direct metal laser sintering, LOM and fusion deposition modeling processes
3	Demonstrate solid ground curing principle and process
4	Discuss LENS, BPM processes; point out the application of RP system in medical field define virtual prototyping and identify simulation components

Program Outcomes (POs)

At the end of the program, the students in CAD/CAM will be able to
1. acquire fundamentals in the areas of computer aided design and manufacturing
2. apply innovative skills and analyze computer aided design and manufacturing problems critically
3. identify, formulate and solve design and manufacturing problems
4. carry out research related to design and manufacturing
5. use existing and recent CAD/CAM software
6. collaborate with educational institutions, industry and R&D organizations in multidisciplinary teams
7. apply project and finance management principles in engineering projects
8. prepare technical reports and communicate effectively
9. engage in independent and life-long learning and pursue professional practice in their specialized areas of CAD/CAM
10. exhibit accountability to society while adhering to ethical practices
11. act independently and take corrective measures where necessary

Course Outcome versus Program Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	M	S	S	S	S	M						
CO-2	M	S	S	S	S	M			M			
CO-3	M	S	S	S	S	M			M			
CO-4	M	M	M	S	M				M			
CO-5	M	S	S	S	S	M			M			

S - Strongly correlated, *M - Moderately* correlated, *Blank - No correlation*
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Teaching-Learning and Evaluation

WEEK	TOPIC / CONTENTS	COURSE OUTCOMES	SAMPLE QUESTIONS	TEACHING-LEARNING STRATEGY	ASSESSMENT METHOD & SCHEDULE
1	Introduction: Need for time compression in product development, Product development, Conceptual design and development, Detail design,Prototype, Tooling, Classification of RP systems.	CO1	1. Explain the product development cycle. 2. Classify RP systems.	Lectures , Seminar	Assignment (week 7)
2	Stereo lithographySystems, Principle, Process Parameters, Process details, Machine details, Applications.	CO1	3. Explain about the process parameters of Stereo lithography systems.		
3	Direct Metal Laser Sintering (DMLS) system, Principle, Processparameters, Process details, Machine details, Applications.	CO1	4. Explain the Direct Metal Laser Sintering system.		
4	FusionDeposition Modeling, Principle , Process parameters, Process details, Machine details, Applications.	CO1	5. Explain the Principle of Fusion Deposition Modeling.		
5	Laminated Object Manufacturing , Principle , Process parameters , Process details , Machine details, Applications.	CO2	1. Explain the principle processparameters, process details, machine details and applications of Laminated Object Manufacturing.	Lectures , Seminar	
6	Solid Ground Curing, Principle, Process parameters, Process details, machine details, Applications.	CO2			
7	3-Dimensional printers,Principle, Process parameters, Process details,Machine details, Applications.	CO2	2. Explain the Principle, process parameters, process details, machine details and Applications of 3-Dimensional		

			printers.		
			3. Explain the process details of jet printer.		
8	Other concept modelers like thermo jet printers, Sanders model Maker.	CO2			
9	Mid-Test 1	CO-1, CO-2			
10	JP system 5, Object Quadra system.	CO3	1. Explain about the JP system 5.	Lectures , Seminar	
11	Laser Engineering Net Shaping (LENS).	CO3	2. ExplainLaser Engineering Net Shaping (LENS) Principle.		
12	Ballistic Particle Manufacturing (BPM) , Principle.	CO4		Lectures , Seminar	
13	Introduction to rapid tooling, Direct and Indirect method, Software for RP – STL files.	CO4	1. Explain the concept of magics and mimics.		
14	Magics, Mimics.	CO4			
15	Applications of Rapid prototyping in Medical field.	CO5		Lectures , Seminar	Seminar (week 11-16)
16	Introduction to Virtual prototyping- End to end prototyping-simulation.	CO5	1. Explain the concept of virtual prototyping.		
17	Components of virtual prototyping- effects- economics of virtualPrototyping.	CO5			
18	Mid-Test 2	CO-3, CO-4, CO-5			
19/20	END EXAM	All Cos			