SCHEME OF COURSE WORK

Course Details:

Course Title	**Advanced Manufacturing Technology L T P C 3 0 0 3**
Course Code	**19ME2106**
Program	**M. Tech**
Specialization	**CAD/CAM**
Semester	**II**
Prerequisites	**Manufacturing Technology-I, Manufacturing Technology-II at UG level**
Courses to which it is a prerequisite	**------**

Course Outcomes (COs):

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

CO	Course Outcomes	Cognitive Level
CO1	Identify the mechanisms of metal removal	Remember , Understand , Apply
CO2	Explain the applications of special machining and high speed machining processes	Remember , Understand , Apply
CO3	Identify features and applications of non-traditional machining.	Remember , Understand , Apply
CO4	Explain various micro machining processes.	Remember , Understand , Apply
CO5	Discuss material addition process and its importance	Remember , Understand , Apply

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
CO1			M	S	S				M		
CO2		S	M	S	S				M		
CO3		S	M	S	S				M		
CO4		S	M	S	S				M		
CO5		S		S	S				M		

S - Strongly correlated, *M - Moderately* correlated, *Blank - No correlation*

Assessment Methods:	Assignment / Quiz / Seminar / Case Study / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week	TOPIC / CONTENTS	Course Outcomes	Sample questions	TEACHING LEARNING STRATEGY	Assessment Method &Schedule
Fundamentals of machining					
1	Introduction - mechanics of cutting - cutting forces and power	CO1	Calculate cutting forces and power requirement	Lecture Discussion Problem solving	Assignment-I (Week 8) Mid-I (Week 9)
2	temperatures in cutting, tool life, wear and failure,	CO1	Explain different types of tool wear	Lecture Discussion	Assignment-I (Week 8) Mid-I (Week 9)
3	surface finish, integrity and machinability.	CO1	How is machinability assessed?		Assignment-I (Week 8) Mid-I (Week 9)
Special machining processes					
4	Deep hole drilling gun drills gun boring trepanning	CO2	Distinguish between drilling and trepanning	Lecture Discussion Videos	Assignment-I (Week 8) Mid-I (Week 9)

5	honing lapping super finishing AFM MAF burnishing broaching.	CO2	Discuss various types of super finishing methods	Lecture Discussion	Assignment-I (Week 8) Mid-I (Week 9)
6	High speed machining, application of HSM tools for HSM - design of tools for HSM high speed and high performance grinding, ultra precision machining.	CO2	Describe the need for high speed machining	Lecture Discussion	Assignment-I (Week 8) Mid-I (Week 9)
Non-traditional machining: mechanism of metal removal, characteristic features and applications					
7	Introduction USM, WJM, AJM,	CO3	Distinguish between WJM and AJM	Lecture Discussion Videos	Assignment-I (Week 8) Mid-I (Week 9)
8	plasma machining, hybrid machining processes,	CO3	.What are hybrid machining processes?	Lecture Discussion	Assignment-I (Week 8) Mid-I (Week 9)
9	**MID-I**				
10	electro-discharge machining (EDM) and electro-chemical machining (ECM) .	CO3	Discuss material removal mechanism in EDM and ECM	Lecture Discussion videos	Assignment-II (Week 17) Mid-I (Week 9)

Micro machining					
11	Types of micro machining processes	CO4	What are different types of micromachining processes?	Lecture Discussion	Assignment-II (Week 17) Mid-II (Week 18)
12	application of micro machining in semiconductor IC technology,	CO4	Discuss different types of deposition methods	Lecture Discussion Videos	Assignment-II (Week 17) Mid-II (Week 18)

13	micro actuator and micro sensors- CVD, PVD and Ion implantation	CO4	Explain ion implantation	Lecture Discussion	Assignment-II (Week 17) Mid-II (Week 18)
Rapid prototyping processes					
14	Fused deposition modelling, Stereo-lithography	CO5	Discuss the capabilities of stereo lithography	Lecture Discussion Videos	Assignment-II (Week 17) Mid-II (Week 18)
15	Multi jet modelling, Selective laser sintering,	CO5	Explain the process selective laser sintering	Lecture Discussion Videos	Assignment-II (Week 17) Mid-II (Week 18)
16	Three-dimensional printing, Laminated object modelling, Solid ground curing,	CO5	Discuss 3-D printing	Lecture Discussion Videos	Assignment-II (Week 17) Mid-II (Week 18)
17	Laser engineered net shaping, virtual prototyping, rapid tooling.	CO5	What are advantages and limitations of virtual prototyping	Lecture Discussion Videos	Assignment-II (Week 17) Mid-II (Week 18)
18	**Mid-II**				
19	**End Semester**				