SCHEME OF COURSE WORK

Course Details:

Course Title	**: COMPUTER AIDED PROCESS PLANNING**		
Course Code	**: 13ME2119**	**L T P C**	**: 4 0 0 3**
Program:	**: M.Tech.**		
Specialization:	**: CAD/CAM**		
Semester	**: II**		
Prerequisites	**: Computer Aided Manufacturing**		
Courses to which it is a prerequisite	**: Manufacturing Technology**		

Course Outcomes (COs):

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

1	Explain NC, CNC and DNC machines
2	Discuss machine control unit, tooling, smart manufacturing and programmable logic control
3	Develop manual part program for various machining operations
4	Develop APT part program for various machining operations
5	Describe other computer aided part programming languages and application of adaptive control in CNC machine

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
CO-1	M	M	S	S							
CO-2			S	S							
CO-3		M	S	S			M				
CO-4			S	S	S		M		M		
CO-5			S	S	S				S		S

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
1	Introduction to CAPP: Information requirement for process planning system, role of process planning, advantages of conventional process planning over CAPP	CO-1	Explain the difference between conventional process planning system and CAPP.	▫ Lecture ▫ Demo class	
2	Structure of automated process planning system and feature recognition methods, Generative CAPP system: Importance, principle of generative CAPP system, automation of logical decisions	CO-1	What is the principle of generative CAPP systems?	▫ Lecture ▫ Discussion	
3	Knowledge based systems, inference engine ,implementation, benefits. Retrieval CAPP systems: Significance, group technology, structure ,relative advantages, ,implementation and applications	CO-1	Explain the significance and advantages of retrieval CAPP systems	▫ Lecture ▫ Discussion	
4	Process planning and concurrent engineering: Process planning, CAPP, concurrent engineering, design for manufacturing, advanced manufacturing planning	CO-2	What do you mean by concurrent engineering?	▫ Lecture ▫ Discussion	
5	Selection of manufacturing sequence: Significance, alternative manufacturing processes, reduction of total set up cost for a particular sequence, quantitative methods for optimal selection, examples	CO-2	Explain the reduction of total set up cost for a particular sequence.	▫ Lecture ▫ Discussion ▫ Problem solving	**Assignment-1 (Week 5 - 7)**
6	Determination of Machining parameters: reasons for optimal selection of machining parameters	CO-3	What are the reasons for optimal selection of machining parameters?	▫ Lecture ▫ Discussion ▫ Problem solving	
7	Effect of parameters on production rate, cost and surface quality, different approaches	CO-3	What is the effect of parameters on production rate, cost and surface quality ?	▫ Lecture ▫ Discussion	
8	Advantages of mathematical approach conventional approach and solving optimization models of machining processes	CO-3	How do you solve optimization models of machining processes?	▫ Lecture ▫ Discussion	**Seminar - 1 (Week 8)**
9	**Mid-Test 1**				**Mid-Test 1 (Week 9)**
10	Determination of Manufacturing Tolerances: Design tolerances, manufacturing tolerances, methods of tolerance allocation	CO-3	Write briefly about the design and manufacturing tolerances	▫ Lecture ▫ Discussion ▫ Problem solving	
11	Sequential approach, integration of design and manufacturing tolerances and advantages of integrated approach over sequential approach	CO-3	Explain the integration of design and manufacturing tolerances	▫ Lecture ▫ Discussion	
12	Generation of tool path: Simulation of	CO-4	What do you mean by NC tool	▫ Lecture	

	machining processes and NC tool path generation		path generation?	▫ Discussion ▫ Problem solving	
13	Graphical implementation,determination of optimal index positions for executing fixed sequence,quantitative methods	CO-4	Explain the determination of optimal index positions for executing fixed sequence.	▫ Lecture	
14	Implementation techniques for CAPP: MIPLAN System	CO-5	Explain about MIPLAN System	▫ Lecture ▫ Discussion	**Assignment-2 (Week 14- 16)**
15	Computer programming languages for CAPP and criteria for selecting a CAPP system.	CO-5	What is the criteria for selecting a CAPP system?	▫ Lecture ▫ Discussion	
16	Benefits of CAPP and computer integrated planning systems	CO-5	What are the benefits of CAPP?	▫ Lecture ▫ Discussion	
17	Capacity planning systems	CO-5	Write briefly about capacity planning systems.	▫ Lecture ▫ Discussion	**Seminar - 2 (Week 17)**
18	**Mid-Test 2**				**Mid-Test 1 (Week 9)**
19/20	**END EXAM**				**END EXAM**