SCHEME OF COURSE WORK

Course Title	COMPUTER AIDED MANUFACTURING AND ROBOTICS LAB		
Course Code	19ME2108	L P C	0 3 1.5
Program:	M.Tech.		
Specialization:	CAD/CAM		
Semester	II		

Course Outcomes (COs):

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

1	Create the part model and simulate drilling operations using CAM software.
2	Generate the tool path and NC part program for milling and turning operations using CAM software.
3	Demonstrate facing, turning and threading operations on CNC lathe.
4	Demonstrate drilling and contouring operations on PKM.
5	Develop programs on robotic arms.

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	S	S	M	M	S				M			
CO-2	S	M	M	M	S				M			
CO-3	M	M	M						M			
CO-4	M	M	M	M					M			
CO-5	M	M	M	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 VIVA QUESTIONS	TEACHING-LEARNING STRATEGY	ASSESSMENT METHOD & SCHEDULE
1	Creating a 2D part model using CAM software	CO1	1. Explain the various commands available in CAM software for creating 2D profile. 2. Describe the procedure for simulating the drilling operation. 3. What is the meaning of G81 and G80 NC code?	Explaining various commands and simulation of CNC operations using CAM software	Day to day experiments, Record
2	Tool path simulation and NC code generation for drilling operations using CAM software	CO1			
3	Tool path simulation and NC code generation for milling operations using CAM software	CO2	1. What are the various operations which can be performed in CNC lathe? 2. Explain the criteria for selecting the particular tools in CNC milling. 3. What is the code for rough turning cycle and finishing cycle?		
4	Tool path simulation and NC code generation for turning operations using CAM software	CO2			
5	Mode selection and tool offsetting on CNC lathe	CO3	1. Explain Edit mode and MDI mode. 2. G00, G01 and G02 code is used for _____. 3. M03, M05 and M30 code means _____.	Demonstration on CNC lathe for facing and turning operations	
6	CNC part program for facing and step turning on CNC lathe machine	CO3			
7	CNC part program for taper and circular turning on CNC lathe machine	CO3			
8	Backlog Experiment/ Revision/ Practice	CO1, CO2, CO3			
9	Mid-Test 1	CO-1, CO-2, CO3			Internal Exam-1 & Viva voce

10	CNC part program for threading on CNC lathe machine	CO3	1. What is the syntax for threading operation on CNC lathe?	Demonstration on CNC lathe for threading operation.	
11	CNC part program on milling machine	CO4	1. Explain the working principle of 3D printing. 2. Explain the various applications of PKM machine. 3. Define degree of freedom.	Demonstration on CNC milling, 3D printing and PKM machine	
12	Design and build a simple solid model using 3D printing	CO4			Day to day experiments, Record
13	Drilling on 2-DOF PKM	CO4			
14	Contouring on 3-DOF PKM	CO4			
15	Programming on 4-DOF SCARA robot	CO5	1. Differentiate between SCARA robot and Articulated robot. 2. Write a program to move the objects from one place to another place.	Demonstration on 4-DOF SCARA robot and 6-DOF Articulated robot	
16	Programming on 6-DOF Articulated robot	CO5			
17	Backlog Experiment/ Revision/ Practice	CO3, CO4, CO5			
18	Mid-Test 2	CO-3, CO-4, CO-5			Internal Exam-2 & Viva voce

19/20	END EXAM	All Cos			Experiments & Viva voce