SCHEME OF COURSE WORK

Course Details:

Course Title	**: MECHATRONICS**		
Course Code	**:13ME2106**	**L P C**	**:4 0 3**
Program:	**: M.Tech.**		
Specialization:	**: CAD/CAM**		
Semester	**: I**		
Prerequisites	**:**		
Courses to which it is a prerequisite	**:**		

Course Outcomes (COs): At the end of the course, the student will be able to

1	Develop a simulation model for simple physical systems and explain mechatronics design process
2	Outline appropriate sensors and actuators for an engineering application
3	Write simple microcontroller programs
4	Explain linearization of nonlinear systems and elements of data acquisition
5	Explain various applications of design of mechatronic systems

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		M	M								M
CO-2	M			M								
CO-3	M	M				M						
CO-4	M											
CO-5						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
1,2	Mechatronics system design	CO-1	▫ What are the design issues to be considered in designing a mechatronic system	▫ Lecture / Discussion/PPT	Assignment (Week 5 - 7) Mid-Test 1 (Week 9)
3,4	Modeling and simulation of physical systems	CO-1	▫ List various building blocks for mechanical, thermal and fluid systems	▫ Lecture / Discussion/ Seminars	Assignment (Week 5 - 7) Mid-Test 1 (Week 9)
5	Sensors and transducers	CO-2	▫ List various sensors and give their applications	▫ Lecture / Discussion/PPT	Assignment (Week 5 - 7) Mid-Test 1 (Week 9)
6,7	Actuating devices	CO-2	▫ Give applications of magnetostrictive actuators	▫ Lecture / Discussion/PPT	Assignment (Week 5 - 7) Mid-Test 1 (Week 9)
8	Fundamentals of microcontroller programming	CO-3	▫ Small programs to be written	▫ Lecture / Discussion/PPT	Assignment (Week 5 - 7) Mid-Test 1 (Week 9)
9	**Mid-Test 1**				
10	Microcontroller programming, examples, Use of Interrupts	CO-3	▫ Small programs to be written	▫ Lecture ▫ Discussion	Seminar Mid-Test 2 (Week 18)
11,12	Signals, systems and controls	CO-4	▫ What are the conditions for a system to be linear?	▫ Lecture	Seminar Mid-Test 2 (Week 18)
13,14	Real time interfacing	CO-4	▫ What is data acquisition?	▫ Lecture ▫ Seminars	Quiz/ Seminar
15,16	Sensors for condition monitoring, mechatronic control in automated manufacturing	CO-5	▫ Brief up an application which uses mechatronic control in automated manufacturing	▫ Lecture ▫ Discussion ▫ Power Point Presentation	Seminar Mid-Test 2 (Week 18)
17	Artificial intelligence in mechatronics, micro sensors in mechatronics	CO-5	Discuss briefly about artificial intelligence and its significance	▫ Lecture ▫ Seminars	Seminar
18	**Mid-Test 2**				
19/20	**END EXAM**				