

## Mechatronics (IEME-024)

Class Period	As per class schedule
Classroom	As per class schedule
Instructor	Shrish Bajpai
Office	Room Number : 315, Second Floor, ECE Department, Civil Building
Office Hours	Lunch Time or by appointment
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**Motivation** : Mechatronics is a field of engineering which deals with the integration of Mechanics and Electronics with intensive computer integration using a multidisciplinary approach to product and manufacturing system design. It is a design philosophy which encourages engineers to integrate precision mechanical engineering, digital and analog electronics, control theory and computer engineering in the design of “intelligent” products, systems and processes rather than engineering each set or requirements separately. With the increase in automated production and computerized manufacturing in industries, requirements for multi-disciplinary engineers with in-depth knowledge of mechanics, electronics, and computers have increased. Further more, the increasing development of automatic production, use of microelectro-mechanical-systems (MEMS), intelligent sensors, and advancement in automotive technology accelerated the growth of mechatronics.

**Syllabus** : This is a working document to help us plan activities for the course. Your input on how to make this a better course is always appreciated.

**Catalog Description** : Fundamental laws and concepts of electronic devices & control theory to control the motion of automated machines (robot).

*Pre-requisite:* Clear knowledge of Engineering Mathematics, Engineering Mechanics & Basic Electronics.

**Textbook** Godfrey Onwubolu, "Mechatronics : Principle & Application", India Reprint, **(Required)** Reed Elsewre India Private Limited, ISBN : 9788131205235.

There is a *plethora* of books on Mechatronics available at the central library. You are urged to check one out and use it as a reference.

**Reading Assignments :** You need to prepare for lecture so you can get the most benefit out of it. You are responsible for reading the sections in the book or search the material on internet, ahead of time as indicated in the lecture plan.

**Course Outline :** The course will be organized in lecture plan according to main themes:

<i>Unit 1</i>	Introduction To Mechatronics & Semiconductor Devices
<i>Unit 2</i>	Analog & Digital Electronics
<i>Unit 3</i>	Sensors & Actuators
<i>Unit 4</i>	Control Theory & Robotic System

**Course Outcomes :** By the end of the semester you will demonstrate the ability to:

1. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability & sustainability.
2. An ability to identify, formulate, and solve engineering problems.
3. Work in a small team using a cooperative learning rules.

**Contribution to Professional Component :** Mechatronics provides an opportunity for engineering students to develop a project oriented, hands-on training experience in a multidisciplinary environment. This will offer them a chance to integrate electrical, electronic, digital and mechanical systems into Mechatronic systems. It will cater to the need of today's automated industry environment as well as design and maintenance of the automated services which has now become so common in use.

**Test and Final Examination:** There will be two midterms during the semester. Typically, a test will have four or five problems. Three problems you have to attempt. The final End

Semester Examination will be an opportunity to challenge any problem scores you wish to improve upon.

**Important:** No make-up exam will be granted without prior permission from the Head of Department. Students are strongly advised to refrain from copying the assignments of their classmates or works submitted at other places. Also they should not do any sort of malpractices during any examinations. Any student found to have violated these rules will be awarded “zero” mark for the respective test/assignment and the matter will be reported to HoD for suitable further action. Also students have to offer perfect discipline in the classroom in all respects.