

**ME466: MECHATRONICS SYSTEMS DESIGN**  
**CREDITS = 5 (L=3, T=0, P=2)**

**Course Objective:** To appraise digital control in the mechatronic system

**Teaching and Assessment Scheme:**

Teaching Scheme			Credits	Assessment Scheme				
L	T	P		Theory		Practical		Total Marks
			ESE	CE	ESE	CE		
3	0	2	5	70	30	30	20	150

**Course Contents:**

Unit No.	Topics	Teaching Hours
1	<b><u>Introduction to Mechatronics:</u></b> Definitions, Measurement and control systems, Microprocessor based controllers, Mechatronic approach.	04
2	<b><u>Modelling and System response:</u></b> Mathematical modelling of mechanical, electrical, hydraulic, pneumatic, thermal and electronics systems, Transfer functions, Time and frequency response of dynamic systems.	08
3	<b><u>Microprocessors and Microcontrollers:</u></b> History, Structure and architecture, Functions and applications of microprocessors, Programmable logic controllers.	08
4	<b><u>Sensors, Transducers and Actuators:</u></b> Definitions, Terms and Terminologies, Types of sensors, transducers and actuators, Applications and selection criteria.	08
5	<b><u>Data acquisition and Signal conditioning:</u></b> Data acquisition, Signal conditioning and filtering, Multiplexers, Pulse modulation, Data presentation systems.	08

<b>Unit No.</b>	<b>Topics</b>	<b>Teaching Hours</b>
6	<b><u>Design and Mechatronics:</u></b> Input/output systems, Computer based modular design, System validation, Remote monitoring and control, Case studies.	07
<b>TOTAL</b>		<b>43</b>

**List of References:**

1. W. Bolton, "*Mechatronics*", Longman.
2. D. G. Alciator, M. B. Histrand, "*Introduction to Mechatronics*", Tata McGraw Hill.
3. D. Shetty, A. K. Richard, "*Mechatronics and System Design*", PWS Publications.
4. A.D. Helfrick, W. D. Cooper, "*Modern Electronic Instrumentation and Measurement Techniques*", Pearson Education, Inc.
5. C. D. Thomson, "*Process Control Instrumentation Technology*", Prentice-Hall International Editions.

**Course Outcomes (COs):**

1. Overview the Mechatronic Systems
2. Formulate mathematical modelling of the system.
3. Overview Microprocessor, Microcontroller and Programmable Logic Controller.
4. Outline sensor, transducers and actuators.
5. Explain data acquisition, signal conditioning and filtering to analyze the system.
6. Apply the fundamentals of mechatronics for a given task.