

Course Code:	ME5020				
Course Name:	Mechatronic Systems Design				
Credits Value:	3 (Notional hours: 150)				
Pre-requisites:	None				
Core/ Optional:	Optional				
Hourly Breakdown	Lectures (hours)	Tutorials (hours)	Practical classes (hours)	Assignments (hours)	Independent Learning & Assessment (hours)
	14	02		58	76

Course Aim: To impart knowledge on the basic elements of mechatronic systems and to enable them to design and implement integrated systems which include electro-mechanical systems, sensors, electronic circuits, microcontrollers and computers.

Intended Learning Outcomes:

On successful completion of the course, the students should be able to;

- **distinguish** various elements of a mechatronics system and describe their operating characteristics;
- **analyze** and select suitable sensors and actuators for mechatronic system development;
- **develop** mechatronic systems through interfacing sensors and actuators with programmable controllers;
- **develop** computer-based data acquisition systems and virtual instruments.

Course Content:

- **Sensors, Actuators and Signals:** Sensors and actuators: sensor and actuator types; properties; drivers. signal characteristics and conditioning, signal processing.
- **Computer Applications in Mechatronics Systems:** Computers in real time control: I/O interface; data acquisition and control; introduction to microcontrollers; motion control. communication protocols: I2C Bus and SPI Bus, CAN Bus etc.
- **Mechatronic System Design:** Design and develop a mechatronics system that demonstrates the integration of mechanical and electromechanical actuators, drive system, sensors with microcontrollers and programmable logic controllers.

Teaching/ Learning Methods:

Classroom lectures, tutorials and in-class exercises and assignments

Assessment Strategy:			
Continuous Assessment 60%		Final Assessment 40%	
Details:		Theory (%)	Practical (%)
Assignments/Quizzes	40%	40%	
Mid semester examination	20%		Other (%) (Project)
Recommended Reading:			
<ul style="list-style-type: none"> ➤ D G Alciatore and M B Histan (2007), <i>Introduction to Mechatronics, and Measurement Systems</i> (3rd edition), McGraw Hill, USA. ➤ Gerald E. Williams, Christopher T. Kilian (2001), <i>Modern Control Technology: Components and Systems</i> (2nd edition), Delmar Thomson Learning, USA. ➤ William Bolton (2015), <i>Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering</i> (6th Edition), Pearson publications, USA. 			