

<b>Devi Ahilya Vishwavidhyalaya, Indore, India Institute of Engineering &amp; Technology</b>				<b>II Year B. Tech. (Mechanical Engineering) (Full Time)</b>	
<b>Course Code &amp; Name</b>	<b>Instructions Hours per Semester and Credits</b>				
<b>4RMPC6  MECHATRONICS</b>	<b>Classroom Instruction (CI)</b>	<b>Lab Instruction (LI)</b>	<b>Term Work (TW) and Self Learning (SL)</b>	<b>Total no. of Hours Per semester</b>	<b>Total Credits  (Total Hours/30)</b>
	<b>L</b>	<b>T</b>	<b>P</b>	<b>TW+SL</b>	
	<b>00</b>	<b>00</b>	<b>40</b>	<b>20</b>	<b>60</b>

### Course Objective:

The course is designed

1. To learn about the construction and working of a variety of sensors/transducers used in mechatronic applications.
2. To learn about the actuation and control of mechatronic systems using hydraulic and pneumatic methods.
3. To learn about the construction and working of mechatronic systems used in a day-to-day lives.

**Pre requisite(s):** Basic course in electrical and electronic devices along with the concepts of digital electronics.

### LIST OF PRACTICAL ASSIGNMENT

1. Study of electrical resistance strain gauges.
2. Study of linear variable differential transformer (LVDT).
3. Study of capacitive transducer.
4. Study of piezoelectric transducer.
5. A mechatronic approach to the study of the following: Printers, Photocopier machine, Ignition system in automobiles, TV remote control, Washing Machine etc.
6. Calibration of pressure gauge using dead weight pressure gauge tester.
7. Calibration of orifice plate using anemometer.
8. Study and Calibration of Thermocouple.
9. Study on Hydraulic system power pack.
10. Study on Pneumatic system power pack.

### BOOKS RECOMMENDED

- [1] W.Bolton, *Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering*, 4<sup>th</sup> Ed, Pearson Education.
- [2] Nitai Gour & P.Mahalik, *Mechatronics: Principles, concepts and applications*, Tata McGraw-Hill Publishing Company Ltd.

- [3] Alciatore David G. & Histan Michael B., *Introduction to mechatronics and measurement systems, 4<sup>th</sup> Ed* McGraw-Hill Publication.
- [4] Carryer J.Edward, Ohline R.Matthew, Kenny Thomas W., *Introduction to Mechatronic Design*, Pearson Education, Indian Edition 2013.
- [5] Ramachandran K.P., Vijayaraghavan G.K., Balasundaram M.S., *Mechatronics Integrated Mechanical Electronic Systems, Wiley India Pvt.Ltd.*
- [6] Narka and Choudhary, *Instrumentation, Measurement and analysis* Tata Mc Graw Hill Publishing Company Ltd.

### Course Outcome:

Students earned credits will develop ability to

Course Out Come (CO)	After completion of the course, students will be able to:
CO1	Acquire the basic knowledge for the application of the core technologies in the areas of mechanics, electronics and information processing to the solution of problems.
CO2	Recognize the need for models of the systems in order to predict their behavior.
CO3	Select and integrate the appropriate devices for the pickup, conditioning and display of signals related to the various processes involved in a mechatronic system.
CO4	Select the suitable actuation system for a mechatronic application.
CO5	Select the suitable control system for a mechatronic application.

### CO-PO- PSO Relationship

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO-1	PSO-2	PSO-3
CO 1	3	3	3	1	3	0	0	0	0	0	1	3	2	0
CO 2	3	3	1	3	1	0	1	0	0	0	1	2	2	0
CO 3	3	2	3	3	3	1	2	0	0	0	0	2	2	1
CO 4	3	2	3	3	1	0	0	0	0	0	2	3	2	0
CO 5	3	1	3	1	1	0	0	0	0	0	1	2	2	0

\* CO (rows) mention nil/very small/insignificant contribution to the PO (column)  
 1→ relevant and small significance    2 → medium or moderate and 3 →strong