

## ELECTRONIC INSTRUMENTATION

<b>Course Code</b>	<b>20EC2501B</b>	<b>Year</b>	III	<b>Semester</b>	I
<b>Course Category</b>	Open Elective-	<b>Branch</b>	Common to All	<b>Course Type</b>	Theory
<b>Credits</b>	3	<b>L-T-P</b>	3-0-0	<b>Prerequisites</b>	Nil
<b>Continuous Internal Evaluation:</b>	30	<b>Semester End Evaluation:</b>	70	<b>Total Marks:</b>	100

---

<b>Course Outcomes</b>	
Upon successful completion of the course, the student will be able to	
<b>CO1</b>	<b>Comprehend</b> the concepts of Electronic instrumentation (L2)
<b>CO2</b>	<b>Identify</b> the Performance characteristics of instruments (L3)
<b>CO3</b>	<b>Illustrate</b> the different types of Signal Generator, Wave Analyzers & Bridges (L3)
<b>CO4</b>	<b>Analyze</b> the various types of Oscilloscopes (L4)
<b>CO5</b>	<b>Illustrate</b> the concept of various types of Transducers.(L3)

---

<b>Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)</b>														
Note: 1- Weak correlation    2-Medium correlation    3-Strong correlation														
* - Average value indicates course correlation strength with mapped PO														
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2
CO1	2					1	2			2				
CO2	2					2	2			2				2
CO3	3					2	2			2				2
CO4		2				2	1			2				2
CO5	2					2	2			2				2
Average* (Rounded to nearest integer)	<b>2</b>	<b>2</b>				<b>2</b>	<b>2</b>			<b>2</b>				<b>2</b>

<b>Syllabus</b>		
Unit No.	Contents	Mapped CO
I	<b>Performance characteristics of instruments:</b> Static characteristics, Errors in Measurement, Dynamic Characteristics, DC Voltmeters-Multi range, Range extension, Thermo couple type RF ammeter, Ohmmeters series type, shunt type, Millimeters for Voltage, Current and resistance measurements.	CO1,CO2
II	<b>Signal Generator &amp; Wave Analyzers:</b> Fixed and variable signal generators, AF oscillators, Standard signal generator, AF sine and square wave signal generators, Function Generators, Basic wave analyzers, Frequency selective wave analyzers, Hetero- dyne wave analyzer, Harmonic Distortion Analyzers, Spectrum Analyzers.	CO1,CO3

III	<b>Oscilloscopes:</b> Dual trace oscilloscope, Measurement of amplitude, period and frequency, Sampling oscilloscope, storage oscilloscope, digital readout oscilloscope, digital storage oscilloscope.	CO1,CO4
IV	<b>Bridges:</b> Wheatstone Bridge, AC Bridges Measurement of inductance- Maxwell's bridge, Measurement of capacitance - Schering Bridge. Wien Bridge, Q-meter.	CO1,CO3
V	<b>Transducers:</b> Resistance, Capacitance, inductance, Strain gauges, LVDT, Piezo Electric transducers, Resistance Thermometers, Thermocouples, Thermistors, Sensistors, force, pressure, velocity, humidity, moisture, speed, Data acquisition system.	CO1,CO5

--

<b>Learning Resources</b>	
<b>Text Books</b>	
1. H.S.Kalsi - Electronic instrumentation, - Tata McGraw Hill, 2 <sup>nd</sup> Ed., 2004.	
2. A.D. Helfrick and W.D. Cooper - Modern Electronic Instrumentation and Measurement Techniques – PHI, 5 <sup>th</sup> Ed., 2002.	
<b>Reference Books</b>	
1. David A. Bell - Electronic Instrumentation & Measurements -, PHI, 2 <sup>nd</sup> Ed., 2003.	
2. Robert A.Twitter, Electronic Test Instruments, Analog and Digital Measurements - Pearson Education, 2 <sup>nd</sup> Ed. ,2004	
<b>E-resources</b>	
1. <a href="https://www.tutorialspoint.com/electronic_measuring_instruments/index.htm">https://www.tutorialspoint.com/electronic_measuring_instruments/index.htm</a>	

---