

<b>BMEE210P</b>	<b>Mechatronics and Measurement Systems Lab</b>		<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
			<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>
<b>Pre-requisite</b>	<b>Nil</b>	<b>Syllabus version</b>				
		1.0				
<b>Course Objectives</b>						
1. To integrate the mechanical systems with electrical, electronics and computer systems for providing multidisciplinary approach. 2. To familiarize the use of transducers, sensors and actuators. 3. To use of software tools for measurement, perception and signal conditioning.						
<b>Course Outcome</b>						
At the end of the course, the student will be able to 1. Practice the various fluid power systems. 2. Implement different sensors for various industrial applications. 3. Caliberate measuring instruments and measure various geometrical features.						
<b>Indicative Experiments</b>						
1.	Design and analysis of hydraulic, pneumatic and electro-pneumatic circuits using automation software and hardware.					
2.	Stepper motor, Traffic light, HMI Programming interface using a PLC.					
3.	Force and Torque measurement using strain gauge.					
4.	Measurement of speed and displacement using linear and rotary sensors.					
5.	Pressure measurement systems using sensors.					
6.	Temperature measurement using RTD and thermocouple.					
7.	Vibration and acceleration measurements using Piezo electric sensor.					
8.	Development of data logging using virtual instrument software.					
9.	Calibration and dimensional measurement using Micrometer, Mechanical Comparator, Vernier Caliper and Dial Gauge.					
10.	Measurement of flatness of the object using dial gauge and taper angle using Bevel Protractor, Dial Gauge and Sine-Bar. Measurement of bores by using Micrometer and Dial bore indicator.					
11.	Measurement of Gear tooth thickness by using Gear tooth Vernier.					
12.	Surface roughness measurement of machined component.					
<b>Total Laboratory Hours</b>						<b>30 hours</b>
<b>Text Books</b>						
1.	Autor: Anthony Esposito (2014). Fluid power with applications. Editorial: Harlow: Pearson Education Limited.					
2.	Rabiee, M. (2018). Programmable logic controllers : hardware and programming. Tinley Park, Il: The Goodheart-Willcox Company, Inc.					
3.	National Instruments (Firm (2003). LabVIEW : measurements manual. Austin, Tex.: National Instruments.					
4.	Lab Manual of prepared by course faculty members.					
<b>Reference Books</b>						
1.	Fluid Power: Hydraulics and Pneumatics, 3rd Edition, Lab Manual.					
2.	LabVIEW TM User Manual LabVIEW User Manual. (2003).					
Mode of assessment: Viva-voce examination, Lab performance & FAT						
Recommended by Board of Studies			09-03-2022			
Approved by Academic Council			No. 65	Date	17-03-2022	