

Department of Mechatronics Engineering				
Transducers & Interfacing (67481)				
Total Credits	3			
major compulsory				
Prerequisites	P1 : Mechanics of Materials (1) (67311) OR Mechanics of Materials (61207) P2 : Electrical Machines (63391) OR Electrical Machines (67316)			
Course Contents				
Static, dynamic and statistical characteristics of measurement system elements. Loading effects in measurement systems. Sensing elements: Resistive, capacitive, inductive, electromagnetic, thermoelectric, elastic, piezoelectric and electrochemical sensing elements. Signal conditioning elements: Deflection bridges and amplifiers. Signal processing elements: Analogue to digital (A/D) conversion. Introduction to specialized measurement systems, optical and ultrasonic measurement systems.				
Intended Learning Outcomes (ILO's)			Student Outcomes (SO's)	Contribution
1	Describes the general measurement system with examples.		A	10 %
2	Analysis static and dynamic characteristics of complete measurement system components and classifies the sensing elements of measurement systems.		C	40 %
3	Identify the loading effects of measurement systems and calculates loading errors.		E	30 %
4	Designing simple transducers and measurement systems		C	20 %
Textbook and/ or References				
Bentley John P. (2005). Principles of Measurement Systems, Fourth Edition, Pearson Prentice Hall, United Kingdom.				
Assessment Criteria			Percent (%)	
First Exam			20 %	
Second Exam			20 %	
Homeworks			10 %	
Final Exam			50 %	
Course Plan				
Week	Topic			
1	The general measurement system.			
2	Static characteristics of measurement system elements.			
3	Static characteristics of measurement system elements.			
4	Static characteristics of measurement system elements.			
5	The accuracy of measurement systems in the steady state. Midterm Exam I			
6-8	Loading effects and two-port networks			
9-11	Sensing elements. Midterm Exam II			
12-13	Signal conditioning elements.			
14-16	14-15 Signal processing elements. 16 Final Exam			