

Course Number and Name												
BBM 405 - Biosensors and Transducer												
Credits and Contact Hours												
3 and 45												
Course Coordinator's Name												
Mr. S.Prasath												
Text Books and References												
Text Books:												
1. Doebelin. E. O, Measurement Systems, McGraw Hill Book Co. 1998												
2. Renganathan S, Transducer Engineering, Allied Publishers, Chennai,2000.												
3. https://www1.ethz.ch/lbb/Education/Biosensors/Lecture_1_overview.pdf												
Course Description												
<ul style="list-style-type: none"> Understand the purpose of measurement, the methods of measurements, errors associated with measurements. Know the principle of transduction, classifications and the characteristics of different transducers and study its biomedical applications. 												
Prerequisites						Co-requisites						
Biology for Engineers, Electronic Instrumentation						NIL						
required, elective, or selected elective (as per Table 5-1)												
selected elective												
Course Outcomes (COs)												
CO1: Describe the purpose and methods of measurements.												
CO2: Explain different display and recording devices for various applications.												
CO3: Know the principle of transduction, classifications and the characteristics of different transducers and study its biomedical applications												
CO4: Remember and understand the concepts, types, working and practical applications of important biosensors.												
CO5: Know some of the commonly used biomedical transducers.												
CO6: Know the different display and recording devices.												
Student Outcomes (SOs) from Criterion 3 covered by this Course												
	COs/SOs	a	b	c	d	e	f	g	h	i	j	k
	CO1	M	H	M	H	H	M	H			L	M
	CO2	M	H	M	H	H	M	H			L	M
	CO3	M	H	M	H	H	M	H			L	M
	CO4	M	H	M	H	H	M	H			L	M
	CO5	M	H	M	H	H	M	H			L	M
	CO6	M	H	M	H	H	M	H			L	M

List of Topics Covered	
UNIT - I	9
SCIENCE OF MEASUREMENT	
Units and Standards - calibration methods - statics calibration - classification of errors, error analysis - statistical methods - odds and uncertainty.	
UNIT - II	9
CHARACTERISTICS OF TRANSDUCERS	
Static characteristics - accuracy, precision, sensitivity, linearity etc - mathematical model of transducers - zero first - order and second - order transducers - response to impulse step, ramp and sinusoidal inputs.	
UNIT - III	9
VARIABLE RESISTANCE TRANSDUCERS	
Principle of operation, construction details, characteristics and applications of resistance potentiometers, strain gauges, resistance thermometers, thermistors, hot-wire anemometer, piezoresistive sensors and humidity sensors.	
UNIT - IV	9
BIOSENSORS - PHYSIOLOGICAL RECEPTORS - J RECEPTORS	
Chemoreceptors, Baroreceptors, Touch receptors, Biosensors - Working Principle and Types, Applications.	
UNIT - V	9
OTHER TRANSDUCERS	
Piezoelectric transducers, magnetostrictive transducer, IC sensor digital transducers - smart sensor - fibre optic transducers.	