

Course Number and Name												
BEE007 & Bio-Medical Instrumentation												
Credits and Contact Hours												
3 & 45												
Course Coordinator's Name												
Dr.S.Prakash												
Text Books and References												
Text Books:												
1. Arumugam M. 'BioMedical Instrumentation', Anumdhaa Agencies, 1992												
2. Gedders L.A. and Baker L.E. 'principles of Applied Bio- Medical instrumentation', John Wiley, 1989.												
References:												
1. Bertill Jacobson and John G. Webster 'Medical and clinical Engineering' Prentice Hall India, 1977												
2. Gedders L.A and Baker L.E 'principles of applied Bio- medical instrumentation', John Wiley-Interscience, 3rd Edition, 1989.												
Course Description												
Discuss the internal circuitry of medical instruments and its maintenance.												
Prerequisites						Co-requisites						
Biology For Engineers												
required, elective, or selected elective (as per Table 5-1)												
Required												
Course Outcomes (COs)												
CO1: Describe the physiology and anatomy of human system.												
CO2: Recognize the technical concepts and operation of medical instrumentation.												
CO3: With widespread use and requirements of medical instruments, this course gives knowledge of the principle of operation and design of biomedical instruments.												
CO4: It attempts to render a broad and modern account of biomedical instruments.												
CO5: It gives the introductory idea about human physiology system which is very important with respect to design consideration												
Student Outcomes (SOs) from Criterion 3 covered by this Course												
COs/SOs	a	b	c	d	e	f	g	h	i	j	k	l
CO1	M	M	M		M		M			M	L	M
CO2	H		H		H						M	M
CO3	M			H	M		M					
CO4	H	M		H	M					M		

CO5		M	M		M					L	M	M
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List of Topics Covered

UNIT I PHYSIOLOGY AND TRANSDUCERS 9

Electrophysiology: cell and its functions- Neuron-Axon-Synapse-Action Potential -Propagation of electrical impulses along the axon-Sodium pump-Salutatory condition- Electrophysiology and Cardiopulmonary systems- Respiration and nervous system and peripheral nervous system

UNIT II ELECTRO – PHYSIOLOGICAL MEASUREMENTS 9

Sensors and recorders: psychological transducer-general consideration for electronic recording systems-basic recording systems-pre amplifiers-direct writing recorders- UV recorders-electrostatic recorders-instrumentation tape recorders

UNIT III NON-ELECTRICAL PARAMETER MEASUREMENTS 9

Modern imaging systems: X- ray machines and computed Tomography-magnetic resonance imaging systems--ultrasonic imaging systems-medical thermography-electron microscope

UNIT IV MEDICAL IMAGING AND PMS 9

Diagnostic equipments: electrocardiograph-electroencephalograph-electromyograph-blood flow meters-blood gas analyzers-computer applications in medical field- ultrasonic equipments-bio telemetry-transmission of physiological data

UNIT V ASSISTING AND THERAPEUTIC EQUIPMENTS 9

Therapeutic equipments: pace makers- defibrillators-dialysers-surgical diathermy machines-laser applications-physiotherapy and electrotherapy equipments