

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Applied Electronics and Instrumentation Engineering (AEIE)
 (Applicable from the academic session 2018-2019)

Course Code : PC-EI 602	Category: Professional Core Course
Course Name: Biomedical Instrumentation	Semester: Sixth
L-T-P: 3-0-0	Credit: 3
Total Lectures: 40	
Pre-Requisites: No -prerequisites	

Objectives:

1. To introduce students information about biomedical instrumentation and its application.
2. To familiarize students about different types bio-signals like ECG, EEG, EMG.

Course Content:

Module No.	Description	Contact Hours
1	BASIC PHYSIOLOGY AND TRANSDUCERS Introduction to the physiology of cardiac, nervous and muscular and respiratory systems. Transducers- Different types of transducers and their selection criteria for biomedical applications.	6
2	BIOPOTENTIAL & BIOELECTRODES Action and resting potential .Electrode theory-different types of electrodes -Hydrogen Calomel, Ag-AgCl, pH, PO ₂ and Pco ₂ electrode and selection criteria of electrodes.	6
3	ELECTRO – PHYSIOLOGICAL MEASUREMENTS: Electrocardiography,Measurement of Electrical Activities in Muscles and Brain: Eectromyography, Electroencephalography and their interpretation.	6
4	NON-ELECTRICAL PARAMETER MEASUREMENTS Measurement of Blood Pressure and Blood flow. Cardiac output and Cardiac rate.	8
5	MEDICAL IMAGING Ultrasound and IR Imaging X-ray machine - Radio graphic and fluoroscopic techniques, Computer tomography . MRI – Ultrasonography	8
6	BIOTELEMETRY	6

	Transmission and Reception aspects of Biological signals via long distance. Application of biotelemetry in patient care.	
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Course Outcomes:

At the end of the course, a student will be able to:

1. Inspect common biomedical signals.
2. Describe the origin of various bio-potentials and explain the role of bio-potential electrodes.
3. Explain the measurement principles for blood flow, blood pressure.
4. Identify various imaging techniques.
5. Illustrate the application of biotelemetry system.

Learning Resources

Text Books:

1. Cromwell – Biomedical Instrumentation and Measurement, PHI
2. Webster J S – Medical Instrumentation – Application and Design
3. Khandpur R S – Handbook of Biomedical Instrumentation, TMH,

Reference Books:

1. Carr – Introduction to Biomedical Equipment Technology 4/e – Pearson
2. Chatterjee Miller – Biomedical Instrumentation, Cengage Learning
3. Astor B R – Introduction to Biomedical Instrumentation and Measurement, McMillan.