

BME312 Biomedical Instrumentation and Systems

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JULY

Synopsis:

The aim of this course is to teach students the principles, applications and design of the medical instruments most commonly used in the health care industry. Quantitative methods of analysis are developed including simplifying assumptions to make the students understand and design an instrumentation system for diagnostic and therapeutic medical applications.

Topics:

- Electrocardiography
- Basic components of electrocardiography
- Blood pressure
- Heart sounds and cardiac output
- Respiratory system and measurements
- Medical imaging systems

Textbooks:

by John G. Webster.: Medical Instrumentation: Application and Design (eTextbook) 4th Edition. John-Wiley & Sons; Inc
ISBN-13: 9780470475126

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ISBN-13: 9780470475126-AA

Learning Outcome:

- Demonstrate the basic principles of medical instrumentation system, covering design, working and maintenance.
- Analyze electrocardiograms and apply electrocardiography principles
- Appraise heart sounds, evaluate blood pressure and blood flow measurements.
- Assess and evaluate respiratory system measurements.
- Discuss medical imaging methods and their applications.
- Design the operation of medical instrumentation systems, consisting of ECG system, blood pressure monitors, heart sound detectors, spirometers.
- Demonstrate the principles of some medical imaging systems such as CT, MRI and ultrasound scanner.
- Analyze and simulate instrumentation systems through laboratory sessions with computer software MATLAB.

Assessment Strategies:

Continuous Assessment Component	Weightage (%)
QUIZ	15
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Sub-Total	30

Examinable Component	Weightage (%)
Written Exam	70
Sub-Total	70

Weightage Total **100**