

BME102 Essentials of Bioelectronics

Level: 1

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY SEMESTER

Synopsis:

BME102 covers an introduction to biomedical equipment technology, involves the application of electronics in the measurement of bio-signals such as the basic principles of various types of signals, electrodes and transducers, the need for the bioelectric amplifier, differential amplifier and the principle of electrocardiogram and ECG amplifier.

Students will study the basics of Fourier series and its application to different waveforms, understand the concept of noise and its relationship with the signal, the problems associated with the acquisition of biopotentials. They will also learn different bioelectric amplifier configurations and the fundamentals of an electrocardiogram recording.

Topics:

- Semiconductor Theory
- Transistor Theory
- Digital Electronics
- Signals, Noise and Filters
- Electrocardiography
- Signal Conditioning

Learning Outcome:

- State basic theoretical principals in physics on bio-electricity and biomedical instrumentation.
- Discuss the problems associated with the acquisition of biopotentials and different types of electrodes used to acquire the biopotentials.
- List the various types of transducers used to measure the physiological measurements such as the concept of the blood pressure and its measurement.
- Explain the requirements for a bioelectric amplifier.
- Describe the basic principle of operational amplifiers and different bioelectric amplifier.
- Apply key mathematical concepts, methods, theories and governing equations necessary to support the areas of biomedical engineering students study.
- Demonstrate knowledge of electronics in the measurement of bio-signals.
- Use practical skills (e.g. related combined heat transfer software tools) relevant to the area of study

Assessment Strategies (Evening Class):

Components	Description	Weightage Allocation (%)
Overall Continuous Assessment	QUIZ 1	15
	QUIZ 2	15
Overall Examinable		

Overall Examinable Components	Written Exam	70
Total		100