



Jordan University of Science and Technology
Faculty of Engineering
Biomedical Engineering Department

BME411 Biomedical Instrumentation - JNQF Level: 7

First Semester 2023-2024

Course Catalog

3 Credit Hours. The fundamental principles of operation and general concepts that are applicable to all instrumentation, the commercial development of medical instruments and regulations of medical devices, It covers the measurements of biopotentials such as ECG, EEG, and EMG, cardiovascular dynamics- pressure, heart sounds, flow and volume of blood, respiratory dynamics- pressure, flow, and concentration of gases, Devices used in therapy such as pacemakers, defibrillators, cochlear prosthesis, transcutaneous electrical nerve stimulation, total artificial heart, lithotripsy, infant radiant warmers, drug infusion pumps, ventilators and anesthesia machines.

Text Book

Title	Introduction To Biomedical Equipment Technology
Author(s)	Joseph J. Carr, John M. Brown
Edition	4th Edition
Short Name	Ref#1
Other Information	-

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref#2	Principles of Biomedical Instrumentation and Measurement	R. Aston; Merrill	1st Edition	-

Class Schedule & Room

Section 1:

Lecture Time: Sun, Tue, Thu : 11:30 - 12:30

Room: M2011

Section 2:

Lecture Time: Mon, Wed : 08:30 - 10:00

Room: M2010

Prerequisites

Line Number	Course Name	Prerequisite Type
102364	MED236A Physioanatomy	Prerequisite / Study
283140	BME314 Medical Electronics li	Prerequisite / Study

Tentative List of Topics Covered

Weeks	Topic	References
Weeks 1, 2, 3	Basic Concepts of Medical Instrumentation	
Weeks 4, 5	Biopotential Amplifiers	
Weeks 6, 7, 8	Blood Pressure and Sound	
Weeks 9, 10, 11	Measurements of Blood Flow and Volume	
Weeks 12, 13, 14	Measurements of the Respiratory System	
Weeks 15, 16	Therapeutic and Prosthetic devices	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Appreciate the role of Biomedical Engineering and develop living ethics. [1SO6] [1L7K1]	10%	
Acquaint basic design concepts essential to the understanding of biomedical engineering. [1SO1, 1SO2, 1SO3, 1SO5]	10%	
Appreciate the applications and limitations of instrumentation in clinical environments. [1SO1, 1SO2, 1SO6, 1SO7]	10%	
Understand the different problem types and problem- Solving approaches in engineering, biology, and medicine. [1SO1, 1SO2, 1SO4, 1SO5, 1SO6]	10%	
Describe the types of research studies and biostatistical parameters used in investigating medical instruments and therapy. [1SO1, 1SO4, 1SO6, 1SO7]	10%	
Describe the generalized static and dynamic characteristics of instrument performance. [1SO2, 1SO6]	10%	

Encourage life long learning, foster teamwork and enhance students? communication skills. [1SO3, 1SO4, 1SO7]	20%	
Understand the engineering methods used to measure blood pressure, sound, flow and other parameters from living systems. [1SO1, 1SO2, 1SO4, 1SO6, 1SO7]	10%	
Develop engineering models that describe cardio vascular and respiratory function. [1SO1, 1SO2, 1SO4, 1SO6, 1SO7]	10%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
13.5	16	9.17	15.17	4.5	26	15.67

Relationship to NQF Outcomes (Out of 100%)	
L7K1	
10	

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