

## Module Information

2022.01, Approved

### Summary Information

Module Code	4501ICBTBE
Formal Module Title	Introduction to Biomedical Engineering
Owning School	Pharmacy & Biomolecular Sciences
Career	Undergraduate
Credits	15
Academic level	FHEQ Level 4
Grading Schema	40

### Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

### Partner Teaching Institution

Institution Name
International College of Business and Technology

### Learning Methods

Learning Method Type	Hours
Lecture	45
Off Site	6
Practical	9
Seminar	6

### Module Offering(s)

Display Name	Location	Start Month	Duration Number	Duration Unit
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APR-PAR	PAR	April	12 Weeks
JAN-PAR	PAR	January	12 Weeks
SEP-PAR	PAR	September	12 Weeks

## Aims and Outcomes

Aims	This module is intended to provide learners about the basic biomedical concepts used in the field of biomedical Engineering. Biomedical Engineering is the application of engineering principles and design concepts to medicine and biology. This field seeks to close the gap between engineering and medicine: It combines the design and problem solving skills of engineering with medical and biological sciences to improve healthcare diagnosis, monitoring and therapy.
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**After completing the module the student should be able to:**

### Learning Outcomes

Code	Number	Description
MLO1	1	Identify the divisions of biomedical engineering and the importance of biomedical engineers in the healthcare industry, demonstrating an understanding of professional and ethical conduct.
MLO2	2	Evaluate anatomical and physiological divisions of the human body.
MLO3	3	Explain the basic fundamentals of biomedical instrumentation.
MLO4	4	Investigate the working principle of different types of transducers used in medical devices.

## Module Content

Outline Syllabus	1. Overview of Biomedical Engineering: Divisions of biomedical engineering, activities of biomedical engineers, ethical issues in biomedical engineering. 2. Overview of the Human Physiological Systems: Brief description of anatomical and physiological divisions of the human body, Human Cell structure and function Resting and Action Potentials, Bio electric Potentials, Source of Biomedical signals3. Fundamentals of Biomedical Instrumentation: Basic Biomedical Instrument, Performance requirements of Medical Instrumentation systems, General constraints in design of Medical Instrumentation systems4. Bioelectric signals and Electrodes: Recording Electrodes, Silver-silver Chloride Electrodes, Electrodes for ECG, Electrodes for EEG, Electrodes for EMG, Electrical Conductivity of Electrode Jellies and Creams, Microelectrodes5. Basic Transducer and principles: Classification of Transducers, Performance Characteristics of Transducers, Displacement, Position and Motion Transducers, Pressure Transducers, Transducers for Body Temperature Measurement, Photoelectric Transducers, Optical Fibre Sensors, Biosensors, Smart Sensors
Module Overview	
Additional Information	Learners will need access to appropriate laboratory, library and IT facilities.

## Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Exam	Formal Written Exam	70	2	MLO2, MLO3, MLO4
Report	Written assignment	30	0	MLO1

## Module Contacts

### Module Leader

Contact Name	Applies to all offerings	Offerings
Karl Jones	Yes	N/A

### Partner Module Team

Contact Name	Applies to all offerings	Offerings
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