Module Code	MEU33B10
Module Name	Quantitative Physiology
ECTS Weighting[1]	5 ECTS
Semester taught	Semester 2
Module Coordinator/s	Professor Richard Reilly
Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline	On successful completion of this module, students should have: LO1 Ability to understand the theoretical concepts involved in the generation of measurable biological data. LO2 Ability to perform quantitative analysis of physiological data. LO3 Ability to design and implement signal processing algorithms on critical physiological data LO4 Ability to employ biomedical signal processing to aid clinical interpretation of data. LO5 Ability to identify, formulate and adapt engineering solutions to unmet biological needs LO6 Ability to model and analyse biological systems as engineering systems **Graduate Attributes: levels of attainment** To act responsibly - Enhanced To think independently - Enhanced To develop continuously - Enhanced To communicate effectively - Enhanced
Module Content	The objective of this module is to provide students with introduction to specific quantitative aspects of human physiology. It examines physiological processes and phenomena, including a selection of mathematical models, showing how physiological problems can be mathematically formulated and studied. It also illustrates how a wide range of engineering and physics subjects can be used to describe and understand physiological processes and systems. The clinical challenges will be proposed around which engineering solutions address such challenges Topics include: • Overview of quantitative physiology • Neural activity • Electrophysiology

[1] TEP Glossary

- Radiology based Imaging
- Pulmonology-Respiration
- Quantitative physiology applied to ageing
- Measurements of kinematics and cognitive function
- Quantitative physiology in the context of connected health
- Challenges and opportunities for quantitative physiology in global health

Teaching and Learning Methods

The module will be based on the combination of lectures, two laboratories (Cardiology-Blood Pressure and Cardiology-Electrocardiography) and discussion and individual assignments. Lecture and lab attendance is compulsory. Assignment grades will be modulated by performance on similar questions at Annual Examinations.

Assessment Details[2]

Please include the following:

- **Assessment Component**
- **Assessment description**
- **Learning Outcome(s) addressed**
- **% of total**
- **Assessment due date**

Assessment Component	Assessment Description	LO Addressed	% of total	Week due
Individual assignments	Individual based assignments including data analysis	LO1-LO6	20	
Laboratory	In Laboratory practical	LO2, LO4	10	
Written Examination	Annual Examinations	LO1-LO6	70	

Reassessment Requirements

Contact Hours and Indicative Student Workload[2]

Contact hours: 25
Independent Study (preparation for course and review of materials): 75hours: Reviewing lecture material, reading recommended articles and reviewing personal notes from lectures.
Independent Study (preparation for assessment, incl. completion of assessment): 25hours: Searching, retrieving, analysing, synthesising information for assignment. Coding solution in Matlab. Writing of the project report

[2] TEP Guidelines on Workload and Assessment

Recommended Reading List	
Module Pre-requisite	EEU33BM1 Anatomy and Physiology
Module Co-requisite	
Module Website	Blackboard
Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.	No
Module Approval Date	
Approved by	
Academic Start Year	2024
Academic Year of Date	2024-2025