

Module Template for New and Revised Modules¹

Module Code	MEU33B10
Module Name	Quantitative Physiology
ECTS Weighting²	5 ECTS
Semester taught	Semester 2
Module Coordinator/s	Professor Richard Reilly
<u>Module Learning Outcomes</u> with reference to the <u>Graduate Attributes</u> and how they are developed in discipline	<p>On successful completion of this module, students should have:</p> <p>LO1 Ability to understand the theoretical concepts involved in the generation of measurable biological data.</p> <p>LO2 Ability to perform quantitative analysis of physiological data.</p> <p>LO3 Ability to design and implement signal processing algorithms to critical physiological data</p> <p>LO4 Ability to employ biomedical signal processing to aid clinical interpretation of data.</p> <p>LO5 Ability to identify, formulate and adapt engineering solutions to unmet biological needs</p> <p>LO6 Ability to model and analyse biological systems as engineering systems</p> <p>Graduate Attributes: levels of attainment</p> <p>To act responsibly - Enhanced</p> <p>To think independently - Enhanced</p> <p>To develop continuously - Enhanced</p> <p>To communicate effectively - Enhanced</p>
Module Content	<p>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, such as electronics, fluid dynamics, solid mechanics and control theory can be used to describe and understand physiological processes and systems.</p> <p>Topics include:</p> <ul style="list-style-type: none">• Overview of quantitative physiology• Neural activity

¹ [An Introduction to Module Design](#) from AISHE provides a great deal of information on designing and re-designing modules.

² [TEP Glossary](#)

- Electrophysiology
- Radiology 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

Assessment Details³

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 MATLAB based assignments	LO1-LO6	20	
Laboratory	In Laboratory practical	LO2, LO4	10	
Written Examination	Annual Examinations	LO1-LO6	70	

Reassessment Requirements

Contact Hours and Indicative Student Workload³

Contact hours: 25

Independent Study (preparation for course and review of materials): 75hours: Reviewing lecture material, reading recommended textbook chapters 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

³ [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	2023
Academic Year of Date	2023