Module descriptor for ME7B04 Basic Medical Sciences/ EEU33BM1 Anatomy and Physiology

Module code	ME7B04 (ME students), EEU33BM1 (JS Bachelor's degree students)
Module name	Basic Medical Sciences (ME students), Anatomy and Physiology (JS Bachelor's degree students)
ECTS weighting	5 ECTS
Semester taught	Semester 1
Module coordinator/s	Dr Roisin McMackin, Dr Eoin O'Neill
Module learning outcomes (LO) with reference to the graduate attributes and how they are developed in discipline	On successful completion of this module, students should have: LO1: An understanding of the major organelles in a human cell and their functions LO2: An understanding of the structure and function of the human cell membrane. LO3: An understanding of the components and function of the human biological systems LO4: An understanding of how proteins are encoded and generated on the basis of DNA sequences LO5: An understanding of how the nervous system produces its functions LO6: An understanding of how the musculoskeletal system produces its functions LO7: An understanding of how the cardiovascular system produces its functions LO8: An understanding of how the respiratory system produces its functions LO9: An understanding of how the immune system produces its functions LO10: An understanding of recent examples of how dysfunctions in human biological systems leads to disease, and how these can be rectified through development of medical devices/technologies. **Graduate Attributes: levels of attainment** To act responsibly - Enhanced To think independently - Enhanced To develop continuously - Enhanced To communicate effectively - Enhanced

Module content	This module is tailored to those who have not studied anatomy and physiology beyond 2nd level education before, or who have not studied anatomy and physiology at least the previous 3 years. The module begins with an overview of human systems and organs, followed by an overview of fundamental cellular structure and function and cell membrane transport systems. The module then focusses on 5 human systems in detail, namely (i) the nervous system, (ii) the respiratory system, (iii) the cardiovascular system, (iv) the immune system and (v) the musculoskeletal system. Guest lecturers, including clinicians, scientists and biomedical engineers will provide examples of real world applications of this knowledge to solving medical problems. Lab practicals will give hands on experience of electrophysiological methods to study the neuromuscular system. As part of in course assessment, students will give a PowerPoint presentation on a device which interacts with one of the physiological systems taught on during the module.
Teaching and learning methods	The module is taught using a combination of lectures, laboratories, flipped classroom and assignments. At the end of each lecture students will receive more specific learning outcomes for the lecture and be expected to undertake self-directed further reading and research.
Assessment details	**Written examination**: - Weighting: 60% of total grade - What: Realtime in person exam - When: Timetabled at end of sem. 1 - Section 1: 10 short answer questions (1 paragraph to 1 page answers), worth 50% of written exam grade - Section 2: 42 MCQs (negative marking, one correct answer), worth 50% of written exam grade **Lab reports (qty: 2)**: - Weighting: 20% of total grade (10% each) - What: Description of protocol, analysis, interpretation, and presentation of data produced - When: Due 10 days after each laboratory class **Group presentation**: - Weighting: 20% of total grade - What: Powerpoint presentation on a medical device/technology which explains how it works to rectify normal function of a human biological system - In groups of 3-5, each person must contribute to presentation and answer atleast one question - When: End of module timetable Attendance: Attendance at lectures and labs is mandatory and attendance will be taken at all classes. A medical note is required if lectures/labs cannot be attended. Insufficient attendance (at least 80% of lectures and 100% of lab practicals) may be reported as non-satisfactory. Students reported as non-satisfactory may be refused permission to sit the end of term examination for the module.
Reassment requirements	In the event of reassessment, candidates must repeat the annual examination for which 100% of the module mark will be dependent.

Indicative student workload	**Contact hours**: 27 lecture hours **Independent study**: 63 hours (preparation and review of materials). **Independent study**: 50 hours (preparation and completion of laboratory reports and group presentation).
Recommended reading list	Human Physiology: From Cells to Systems, Lauralee Sherwood Campbell's Biology, Neil Campbell, Jane Reece, Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, Robert B. Jackson
Module pre-requisite	None
Module co-requisite	None
Module website	https://www.tcd.ie/medicine/physiology/
Other schools/departments involved in delivery of this module?	Physiology
Module approval date	2024
Approved by	Dr Roisin McMackin
Academic start year	2024

Academic year of date	2024/2025			
Taught content	Lectures and laboratory practicals are listed below, **but are subject to change – Any amendments will be highlighted at lectures.**			

Lecture	Lecturer	Date	Time	Venue
Physiological organisation: Cells, tissues, organs and systems	ROISIN MCMACKIN	Wed 25th Sept	12-1	Geography Seminar Room B, Museum Building
Cell organelles, gene transcription and translation	ROISIN MCMACKIN	Wed 2nd Oct	12-1	Geography Seminar Room B, Museum Building
Nervous System I, overview of nervous system organisation and contents	ROISIN MCMACKIN	Fri 4th Oct	2-3	2nd Floor Simon Perry Building
Nervous System II, membrane potential and neurotransmission	ROISIN MCMACKIN	Fri 4th Oct	3-4	2nd Floor Simon Perry Building
Electroencephalography laboratory practical	ROISIN MCMACKIN	Wed 9th Oct	10-1	Physiology teaching lab, Floor 2, TBSI
Nervous System III, autonomic and somatic nervous system	ROISIN MCMACKIN	Fri 11th Oct	2-3	2nd Floor Simon Perry Building
Musculoskeletal system I	TBD	Fri 11th Oct	3-4	2nd Floor Simon Perry Building
Specialist lecture: Deep brain stimulation and spectral electromyography	Jeremy Liegey	Fri 11th Oct	4-5	2nd Floor Simon Perry Building
Muscle excitability laboratory practical	ROISIN MCMACKIN	Wed 16th Oct	10-12	Physiology teaching lab, Floor 2, TBSI
Musculoskeletal system II	TBD	Fri 18th Oct	2-3	2nd Floor Simon Perry Building
Specialist lecture: Measuring motor function and impairment	Conor Hayden	Fri 18th Oct	3-4	2nd Floor Simon Perry Building
The Respiratory System	Suzanne Cloonan	Wed 30th Oct	12-1	Geography Seminar Room B, Museum Building
Cardiovascular system I	TBD	Fri 1st Nov	2-3	2nd Floor Simon Perry Building
Cardiovascular system II	TBD	Fri 1st Nov	3-4	2nd Floor Simon Perry Building
Specialist lecture: Lung Cancer	Martin Barr	Fri 1st Nov	4-5	2nd Floor Simon Perry Building
Blood and Immune System I	EOIN O'NEILL	Wed 6th Nov	12-1	Geography Seminar Room B, Museum Building
Blood and Immune System II	EOIN O'NEILL	Fri 8th Nov	2-3	2nd Floor Simon Perry Building
Specialist lecture: Neurocardiovascular regulation in Health and Age-Related Disorders	Ciaran Finucane	Fri 8th Nov	3-4	2nd Floor Simon Perry Building

Exam breakdown and Q&A	Roisin McMackin, Eoin O'Neill	Wed 13th Nov	12-1	Geography Seminar Room B, Museum Building
Group presentations with questions	Roisin McMackin, Eoin O'Neill	Fri 15th Nov	2-6	2nd Floor Simon Perry Building