

Module Details	
Module Title	Human Physiology, Biochemistry and Microbiology
Module Code	PHA4014-D
Academic Year	2024/5
Credits	40
School	Life Sciences (Faculty-wide)
FHEQ Level	FHEQ Level 4

Contact Hours	
Type	Hours
Directed Study	320
Practical Classes or Workshops	26
Seminars	6
Lectures	36
Tutorials	12

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Academic Year

Module Aims
To introduce students to the core principles of biology, and the functional organisation of the human body using a 'systems' approach to normal anatomy and physiology with selected examples of pathophysiological changes and disease. The module also presents the biochemical basis of life, and the nature and the diversity of microbes and host/microbe interactions in health and disease.

## Outline Syllabus

The module will provide an overview of human biology. Anatomy and physiology of the human body's major organ systems Human anatomy and physiology of the major organ systems (digestive, endocrine, nervous, musculoskeletal, cardiovascular, respiratory and genitourinary systems) and selected examples of pathophysiological changes and diseases. A basic introduction to Pharmacology and Immunology.

Biochemical basis of life: covalent, and non-covalent bonding in biomolecules, basic structure and function of nucleotides and nucleic acids; carbohydrates, fatty acids and amino acids, Buffers and equilibria; Energy generation and metabolism: Enzyme structure, factors affecting catalysis, enzyme kinetics, co-factors, inhibition and regulation, Energy generation via TCA cycle and Electron transport chain, Glycogen metabolism, Amino acid metabolism and Urea cycle, Lipid metabolism. Studying biomolecules: protein folding, biochemistry applied in the modern world from clinic to research, basic principles of imaging techniques used in biochemistry, introduction into biochemistry in disease.

The latter part of the module will deliver the basics of the microbial world, including a discussion of the structure and function of prokaryotes, nutritional and physiological requirements and environmental factors affecting microbial growth. The nature and structure of viruses including bacteriophages will be covered. The interactions between microbes and humans will be studied including: the role of human commensal flora; bacterial, fungal and viral diseases and their prevention. Life cycles, epidemiology, pathological effects and control of protozoa and other parasites responsible for important diseases of humans will also be discussed. Industrial uses of micro-organisms, food microbiology, nutrient recycling and the importance of microbes in the biodegradation of wastes and pollutants will be studied.

## Learning Outcomes

Outcome Number	Description
01	Understand the normal structure and evaluate the functioning of selected body systems and their control and recognise gross disturbances of the systems.
02	Interpret the fundamental concepts of microbiology.
03	Understand and apply the core principles of the structure and function of the human body, including those that are relevant to microbiology, and evaluate the relationship between health, disease, disorder and dysfunction.
04	Evaluate the structure, function and metabolism of molecules of biological importance including carbohydrates, lipids, nucleotides, proteins and enzymes.
05	Understand the relationship between the basic biological molecules in health and disease. Evaluate the basis of common biochemistry techniques and how they are applied in healthcare and research.
06	Accurately present and communicate core principles and application of knowledge in biology with structured and coherent arguments.
07	Employ effective time management, responsibility for self-directed learning and be able to work in partnership with others.

## Learning, Teaching and Assessment Strategy

Interactive lectures, workshops supported by Anatomage and tutorial sessions (incorporating study material) will enable students to enhance their understanding of core principles of human physiology, biochemistry and microbiology. The virtual learning environment (VLE) tutorials/discussions will support learning through the curriculum. Students will work in a group to apply their knowledge and make sound judgements of physiology, biochemistry and microbiology concepts.

Directed study will provide students with the opportunity to undertake guided reading and to develop their portfolio of learning to understand the core principles and enhance transferable skills and knowledge relating to the evaluation of their own role and subject provision. The VLE will be used to provide access to online resources, lecture notes and external links to websites of interest and for classroom tests.

The information will be reinforced by laboratory sessions in the 'Integrated Laboratory and Skills Development -1' module.

Classroom tests (MCQs - individual) support as diagnostic tests, providing students with an opportunity to apply the principles covered by this module and enhance understanding using a range of literature sources. Model MCQ questions will be discussed in lectures/workshops.

The research-informed formative and summative application exercises based on case studies (group task) will enable the application of knowledge and problem-solving skills within the core subject, and support students to develop their group work skills, learn from their peers, communicate to a specialist audience and demonstrate good time management skills.

The final (individual, closed book) exam will assess students' ability to apply knowledge and accurately present and communicate biology concepts with structured and coherent arguments.

### Mode of Assessment

Type	Method	Description	Weighting
Summative	Classroom test	MCQ test (individual)	20%
Summative	Classroom test	Application exercise [Supplementary assessment will be an individual task, 2000 words, 30%]	30%
Summative	Examination - Closed Book	Written Exam ? closed book	50%
Formative	Classroom test	Model questions in lecture/workshop (30 mins)	N/A
Formative	Classroom test	Application exercise (30 mins)	N/A

### Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>

**Please note:**

*This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.*