UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Molecules of Life
Module Code	BIS4017-B
Academic Year	2024/5
Credits	20
School	Life Sciences (Faculty-wide)
FHEQ Level	FHEQ Level 4

Contact Hours	
Type	Hours
Directed Study	162
Laboratories	9
Supervised time in studio/workshop	4
Lectures	25

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 1

Module Aims

Understanding how molecules within a cell interact is key to being able to understand how the human body responds to physiological changes or drug treatments.

This module supports the programme by developing learners? knowledge of the underlying concepts and core principles of Biomedical Science (PLO1) through the development of understanding of key chemical principles relevant to biological systems.

This module covers the basic molecules of life, metabolism and function of these molecules and the role of electrolyte and pH homeostasis in supporting their physiological conformation.
The biochemistry of processes that support life including cellular metabolism and its control will also be covered.

This module will support those students seeking knowledge to support their employment or further study in medicine and medical research. It emphasises the importance of molecular interactions in normal physiological responses.
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Outline Syllabus
Academic Content: Introduction, aims and relevance; Block 1: Biomolecules: Covalent, and non-covalent bonding in biomolecules, basic structure and function of nucleotides and nucleic acids; carbohydrates, fatty acids and amino acids; electrolytes, buffers and pH homeostasis. Block 2: 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. Block 3: Basic pharmacology and drug metabolism, inborn errors of metabolism, protein folding and disease. Employability and enterprise skills: Biomedical knowledge and understanding Communication Laboratory skills Data analysis Critical thinking Academic Content: Introduction, aims and relevance; Block 1: Biomolecules: Covalent, and non-covalent bonding in biomolecules, basic structure and function of nucleotides and nucleic acids; carbohydrates, fatty acids and amino acids; electrolytes, buffers and pH homeostasis. Block 2: 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. Block 3: Basic pharmacology and drug metabolism, inborn errors of metabolism, protein folding and disease. Employability and enterprise skills: Biomedical knowledge and understanding Communication Laboratory skills Data analysis Critical thinking

Learning Outcomes	
Outcome Number	Description
01	Describe the structure, function and metabolism of molecules of biological importance (HCPC standard 13), including carbohydrates, lipids, nucleotides, proteins and enzymes.
02	Explain the relationship between the basic biological molecules in health and disease. Explain the basis of common biochemistry techniques and how they are applied in healthcare and research.
03	Select and interpret biochemical investigations using simple enzyme kinetic data and design experiments, report, interpret and present data using scientific convention, including application of SI units and other units used in biomedical practice (HCPC standards 3, 14 and 15).
04	Employ skills in data handling.

Learning, Teaching and Assessment Strategy

Teaching and Learning Methods: The LTA strategy encompasses education for employability and equal opportunities for learners.

Information outlining the subject knowledge and understanding is delivered via lectures and workshops. Formative MCQ tests and quizzes on the lecture material will be made available via the virtual learning environment (VLE) to support knowledge, understanding and autonomous learning.
The practical classes will provide experience with basic biochemical techniques and insights into metabolic processes. The laboratory sessions will involve working as a team, interpreting data, planning of experimental work and working to deadlines.

During directed study hours, students are expected to undertake reading to consolidate and expand on the content of formal taught sessions; research and prepare for assessments and revise material from formal taught sessions.

Private study will be facilitated and supported via the use of the VLE which will provide coursework advice and feedback, and revision support.

Formative MCQ tests will be made available via the virtual learning environment (VLE) at the completion of each teaching block as well as at the end of each semester, providing immediate feedback for learners to self-assess their understanding and progress.
Formative feedback on example problems will be given during teaching sessions before the assessed problem-based coursework.

An MCQ exam will be used to test breadth of knowledge whilst a problem solving class test will assess deeper understanding of the core material.

Reassessment of failed elements will be as per the initial method of assessment. Where reassessment of the laboratory practical element is required, students will be given a data set or an opportunity to complete the laboratory practical on an alternative occasion, whichever is more appropriate.

Mode of Assessment

Type	Method	Description	Weighting
Summative	Examination - MCQ	Multiple-choice question (MCQ) examination to test knowledge and understanding of core concepts.	50%
Summative	Coursework - Written	Problem-solving based coursework.	50%

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.

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