UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Clinical and Analytical Biochemistry
Module Code	BIS5013-B
Academic Year	2024/5
Credits	20
School	School of Chemistry and Biosciences
FHEQ Level	FHEQ Level 5

Contact Hours	
Type	Hours
Lectures	20
Online Tutorials (Synchronous)	6
Practical Classes or Workshops	6
Directed Study	168

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

Module Aims

Clinical and Analytical Biochemistry is the division of laboratory medicine that deals with the measurement of chemicals in blood, urine and other body fluids. Test findings are useful for detecting health problems, determining prognosis and guiding patient therapy.

This module supports the programme by developing learners? knowledge and critical understanding of the well-established principles of Biomedical Science (PLO6). It also enables learners to evaluate and discuss the laboratory specialities of clinical biochemistry (PLO7).

The aim of this module is to develop an understanding of how biochemical techniques are used in biomedical sciences to screen, diagnose, monitor, treat diseases and develop new therapeutic strategies in the treatment of diseases. Learners will develop presentation and data analysis skills.

This module will help those students seeking knowledge to support their employment in medicine and medical research. It emphasises the importance of biochemical analysis of human samples in the diagnosis of health and disease.

Outline Syllabus

Academic content

Introduction to clinical biochemistry and external and internal standardisation; inter-laboratory standardisation and quality management.

Studying biomolecules: biochemistry applied in the modern world from clinic to research, basic principles of imaging techniques used in biochemistry.

Biochemical methods for detection of disease including: absorbance, fluorescence, luminescence and infrared spectra. Organ function tests (e.g. liver and cardiac function tests) and diagnostic enzymology. Lipoprotein and cholesterol relationship with disease and lipoprotein analysis. Amino acids, pH and pKa. Electrophoresis techniques including isoelectric focusing and SDS PAGE. Introduction to mass spectrometry and clinical uses. Column chromatography, high performance liquid chromatography, ion exchange, exclusion and affinity chromatography.

The principles and applications of biochemical investigations used for screening, diagnosis and monitoring of Diabetes Mellitus, including near-patient testing.

Biochemical effects of malignant disease and tumour markers. Biochemistry of renal function.

Acid base balance, electrolyte balance, parenteral fluids and nitrogen balance.

Employability and Enterprise Skills:
Biomedical knowledge and critical understanding
Laboratory skills
Communication skills
Data analysis
Critical thinking
Application of knowledge

Learning Outcomes

Outcome Number	Description
01	Explain how a disease is caused at the biochemical level, why that causes the symptoms observed and what analytical methods are employed for diagnosis and prognosis of the patient.
02	Recognise and describe the principles and application of laboratory protocols relevant to a range of routine investigations and be able to analyse and evaluate the information collected (HCPC standard 14).
03	Evidence of ability to conduct appropriate laboratory investigations safely and skillfully.

Learning, Teaching and Assessment Strategy

The LTA strategy encompasses education for employability and equal opportunities for learners. Information outlining the knowledge and understanding required of this module is delivered in lectures that are characterised by active learning concepts. Supporting information in the form of quizzes is provided via the virtual learning environment (VLE) to promote autonomous learning. This information is reinforced in workshops related to material covered in the lectures, using case studies and data analysis to develop analysis and interpretation skills.

Practical sessions provide the opportunity to gain experience in use of clinical and analytical biochemical methods and analyse and evaluate data that is summatively assessed. 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; revise material from formal taught sessions, and undertake specific elements of reading as directed.

This mix of methodologies will be accessible to different learning styles and will develop critical thinking and interpretative skills through case studies.

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

Knowledge and skills will be assessed in a laboratory report and a computer-based assessment, which will be problem based and cover theory and laboratory knowledge.

A formative test will be made available via the VLE. At the completion of each teaching block, as well as at the end of each semester, formative MCQ tests via the VLE will be made available, providing immediate feedback for learners to self-assess their understanding and progress.

Reassessment of failed elements will be as per the initial method of assessment.

It is a requirement of the IBMS that ALL assessments in this module MUST be passed with a minimum mark of 40%. (This requirement applies only to students on IBMS-accredited courses: BSc Biomedical Science; BSc Healthcare Science; BSc Applied Biomedical Science.)

The following statement applies to learners that are completing this module as part of an Apprenticeship.

The apprentice must meet all the required standards when measured against each individual learning outcome for the module (as mapped below):

Healthcare Science Practitioner: 5.1, 5.5

Mode of Assessment

Type	Method	Description	Weighting
Summative	Laboratory Report	Lab report (LO2-3) MUST PASS AT 40%	50%
Summative	Computerised examination	Open book, computerise problem-based assessment (theory and laboratory work) (LO1) MUST PASS AT 40%	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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