MODULE SPECIFICATION

Part 1: Information			
Module Title	Clinical Biochemistry		
Module Code	USSKBL-30-3	Level	2
For implementation from	September 2021		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Health and Applied Sciences	Field	Applied Sciences
Department	Applied Sciences		
Contributes towards	This module is compulsory on all variants of BSc (Hons) Biomedical Science		
Module type:	Standard		
Pre-requisites	Studies in the Biology of Disease (USSKAT-30-2)		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Blood/urine samples have been used for many years to aid the diagnosis of disease. Clinical biochemistry is concerned with the study of biochemical parameters measured in blood samples and other body fluids such as urine, which reflect changes in cellular processes resulting from a pathological condition. Many different biochemical parameters may be investigated and a particular disease may only change one of these or perhaps, many. An understanding of events which bring about these biochemical changes can aid the clinician in correctly diagnosing the patient. Clinical biochemistry also plays an important role in screening for and monitoring treatment of disease. Modern clinical biochemistry involves the use of molecular biological techniques to aid diagnosis or to screen for diseases like cancer or inherited defects of metabolism.

SYLLABUS OUTLINE:

Enzymes and clinical utility

Examples of specific clinically relevant enzymes. Tissue damage and relationship to diagnostic use of enzymes and isoenzymes. Clinical utility is an area which under pins all of current diagnostic clinical biochemistry, discussing the value of biochemical and molecular biological tests in the investigation of disease. Introducing concepts such as sensitivity, specificity, predictive values and population selection.

Liver function/disease

Review of fundamental liver biochemistry. Causes of acute and chronic liver disease. Liver function tests. Differential diagnosis of jaundice and other disorders.

Disorders of detoxification and excretory mechanisms - renal
Review of normal kidney functions. Tests of the glomerular function – renal clearance, GFR, serum creatinine and urea determinations. Outline of tests of tubular function. Renal calculi and their investigations. Urinary protein markers will also be discussed.

Fluid and electrolyte balance
Fluid and electrolyte balance is central to the management of any patient who is seriously ill. In this lecture series water and sodium balance together with hypo/hypernatraemia, hypo/hyperkalaemia will be discussed.

Acid-base disorders
Review of fundamental acid-base concepts. Metabolic and respiratory causes and clinical effects of acidosis and alkalosis. Disturbances to oxygen transport. Assessment of acid-base status; diagnosis and management of acid-base disorders.

Endocrinology disorders
This will discuss the disorders of the hypothalamic-pituitary-target organ axis, with particular reference to the thyroid and adrenal glands. Other disorders of endocrine control will be studied which involve other systems of the body, for example: abnormalities in calcium metabolism; abnormalities in control of electrolyte and fluid balance. Furthermore, case studies will be used to discuss disorders of gonad function.

Cancer, Tumour markers, Toxicology and drug therapy
Pathophysiology of tumors. Tumor biomarkers. Paraproteins as an example of the use of proteins as tumour markers. Treatment of cancer using cytotoxic drugs.

Plasma lipids and lipid disorders
An understanding of the pathophysiology of plasma lipid metabolism is usefully based on the concept of lipoproteins, the form that circulates in plasma. This will be studies in the context of hyperlipidaemias, diabetes and lifestyle disorders. Plasma protein and markers of cardiovascular disease will be discussed.

Molecular genetics in disease.
This topic introduces the role of molecular genetics in the investigation and understanding of disease processes such as in-born-errors of metabolism and cancer.

Biomarkers of bone disease and electrolyte imbalance will be covered in coursework assessments

TEACHING AND LEARNING
LEARNING APPROACHES
Lectures: This module will be delivered in discrete sections, following the subject areas outlined in the syllabus. Each topic area will be introduced with underpinning lectures followed by a series of tutorials where extensive use of case studies will be made. Guided reading will be provided in advance of lectures and handouts will be available on Blackboard.

Tutorials: Students will be supplied with a case study (see below) prior to the tutorial session. Tutorials will use indicative lists of questions to guide student learning. It is expected that the case study will be completed before the tutorial. Therefore, the tutorial will engage active discussion on individual and group findings. **Case studies will be part of the final year assessment and therefore attendance at tutorials is strongly encouraged.**

Review communication (A3 format): Students will also be required to prepare a review communication on an area of clinical biochemistry. Using an A3 format, you should outline the patho-physiology that enables clinical biochemical and/or molecular biology investigations to aid diagnosis or monitoring of the disease(s) and discuss recent advances in these areas.

Case studies: Case studies will be used to provide the basis of the tutorial programme. Each case study

will develop a theme outlined in one of the core lectures. Each case study will be followed by a number of questions directly relevant to that case. Also, there will be an additional set of questions, which are more wide-ranging, designed to link together other aspects of clinical biochemistry with the case. Before the tutorial, you will have to prepare answers to the questions and be ready to discuss your answers within small groups with the lecturer. The questions given with each case study should be used to direct your reading and study.

Independent learning: In addition to lectures and tutorials, students are expected to engage in independent reading where core textbooks and journals are highlighted. The expected time is 228 hours.

Part 3: Assessment: Strategy and Details

There are three pieces of assessment, two pieces of coursework and one examination.

The coursework is designed to develop students' understanding of how pathophysiology is related to clinical outcome. In the first assessment, students are required to summarise pathophysiological and research information on an assigned disease in a poster communication, and to explain why an individual presents clinically. This encourages students to engage with research in the field early on in the module, and to gain an appreciation of recent advances in this area. The second piece of coursework is a case study, which develops critical analysis skills and helps to prepare students for the final examination, which has a case study element within each question. The nature of the coursework assignments reduces the risk of plagiarism occurring.

The controlled assessment is one 3-hour examination, which comprises questions that cover all areas of the module, and which assesses students' ability to describe pathogenic pathways and interpret biomedical data in an integrated manner.

All assessments develop the students' ability to write concisely, focussing on the main aspects of the task. This skill is transferrable to all areas of employment as such succinct reports are often required. Formative feedback is provided in class. For example, we discuss exam questions and offer the opportunity for students to submit an exam style answer for tailored feedback.

Identify final timetabled piece of assessment (component and element)	Component A	
% weighting between components A and B (Standard modules only)	**A:** **50**	**B**: **50**

First Sit	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1.Written examination (3 hours); Assessment Period 2	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1.Poster communication (A3 format; 1500 words)	50
2.Case study (1500 words)	50
Resit (further attendance at taught classes is not required)	
Component A (controlled conditions)	**Element weighting** **(as % of component)**

Description of each element	
1.Examination (3 hours); Assessment Period 3	100
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Poster communication (A3 format; 1500 words)	50
2. Case study (1500 words)	50

Part 4: Learning Outcomes & KIS Data

Learning Outcomes

On successful completion of this module students will be able to:

- Interpret biomedical data in the investigation and diagnosis of disease and discuss the origin and effects of an abnormal biochemical profile.
- Critically appraise the nature and diagnosis of disease in terms of abnormalities in the biochemical and molecular biological aspects of cellular process.
- Discuss the relevance of biochemical, molecular biological diagnostic tests in the investigation of disease.
- Critically and analytically appraise relevant scientific literature.
- Present scientific information as a review communication.

Key Information Sets Information (KIS)

Contact Hours

Hours to be allocated	Scheduled learning and teaching study hours	Independent study hours	Placement study hours	Allocated Hours
300	72	228	0	300

The table below indicates as a percentage the total assessment of the module which constitutes a;

Written Exam: Unseen written exam
Coursework: Media Clip

Total Assessment

Total assessment of the module:	
Written exam assessment percentage	50%
Coursework assessment percentage	50%
	100%

Reading List

https://uwe.rl.talis.com/search.html?q=usskbl-30-3

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First CAP Approval Date	28/03/2014			
Revision Approval Date	PER 28/11/2018 – see PER outcome report	Version	2	