Module Specification

Infection and Disease

Version: 2025-26, v4.0, Approved

Contents

Part 1: Information

Module title: Infection and Disease

Module code: USSKA7-30-1

Level: Level 4

For implementation from: 2025-26

UWE credit rating: 30

ECTS credit rating: 15

College: College of Health, Science & Society

School: CHSS School of Applied Sciences

Partner institutions: None

Field: Applied Sciences

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module covers the key disciplines within Biomedical Science including Haematology and Transfusion, Clinical Biochemistry, Cellular Pathology and Oncology, Applied Immunology, Medical Genetics and Medical Microbiology. You will learn about the mechanisms and diagnosis of a range of diseases, along with the body's response to disease. The latest issues in microbiological public health will also be discussed.

Features: Not applicable

Educational aims: This module aims to introduce the main disciplines in Biomedical Science as outlined above. Through lectures and practical classes, you will develop diagnostic, observational, analytical, and interpretive skills essential for a career in biomedical science, as well as an understanding of the biological basis of disease. By the end of this module, you will be prepared for the more advanced topics that are taught in the subsequent years of the Biomedical Science degree.

Outline syllabus: Haematology and Transfusion:

Overview of haematopoiesis in health, and regulatory mechanisms controlling haematopoiesis. The roles of red cells, white cells and platelets will be introduced, together with outlining their involvement within selected haematological disorders. An overview of haemostasis in health, and how this can be altered in selected haemorrhagic and thrombotic states. Introduction to blood transfusion, including the biological basis of blood group systems, and laboratory blood grouping and compatibility testing techniques.

Clinical Biochemistry:

Introduction to clinical biochemistry; how analysis of biochemical components of body fluids enables diagnosis, and monitoring of health and disease. Overview of the types of clinical biochemistry biomarkers; and how biomarkers are analysed and interpreted. Liver disease and diabetes are introduced as examples of disease which can be diagnosed using clinical biochemistry. Overview of liver disease and how acute and chronic liver disease, and cholestasis, are diagnosed using liver function biomarkers. Overview of type I and type II diabetes and diagnosis with metabolic biomarkers.

Cellular Pathology and Oncology:

Introduction to clinical pathology; the study of organs, tissues and cells for the diagnosis and monitoring of disease. Overview of sample analysis including histopathology (tissue) and cytology (cells); how samples are processed and then visualized using histochemical and immunohistochemical staining. Cancer is

introduced as an example of how cellular pathology is used to diagnose disease and covers; epidemiology; mechanisms of tumour initiation (oncogenes and tumour suppressor genes) promotion and progression; the “Hallmarks of Cancer”; and the differences between benign and malignant tumours. Diagnosis and prognosis of cancer using histopathology is explored, including determining grade and stage, and the importance of metastasis in the clinical outcome.

Applied Immunology:

Introduction to immunology and the key components of the innate and adaptive immune system, including immune cells and antigen recognition mechanisms (cell receptors and antibodies). Introduction to applied immunology; how antibodies can be used for clinical diagnosis of disease by antigen detection (immunoassay). Acute inflammation is introduced as an example of how the immune system behaves in response to injury or infection, and how this can lead to disease (chronic inflammation). Atherosclerosis is introduced as a specific example of chronic inflammation in response to a persistent inflammatory stimulus (oxidized lipoprotein), and how this leads to cardiovascular disease.

Medical Genetics:

Introduction to medical genetics; how genes are mutated, and the causes and consequences of DNA damage. Overview of genetic material, chromosome classification, chromosomal abnormalities and associated syndromes. Introduction to the analysis and interpretation of genetic data and their clinical significance; detection of chromosomal aberrations at the chromosome level (cytogenetics) and DNA sequence level (molecular genetics), and how gene mutations affect the protein.

Medical Microbiology:

Introductory microbiology:
Overview of the range, nutrition and taxonomy of microorganisms. Taxonomic grouping of Bacteria, based on primary characteristics, will be addressed and

Archaea, fungi, viruses and protozoans will be introduced. Theory and laboratory practice of isolating, identifying and enumerating microorganisms.

Microbial interactions:
Introduction to the human microbiota; its role in health and disease.

Medical microbiology - Development of the discipline:
The history of medical microbiology: a review of the “golden age” of microbiology and its leading figures; the role of the medical microbiologist today, including developments which aid in the understanding of pathogens and diagnostics.

Medical microbiology - Diseases:
Coverage of a range of medically important bacteria, viruses, fungi and parasites: an overview of the range of diseases that microbes cause (nationally and globally), from the trivial to the life-threatening. Infections of the gastrointestinal tract, respiratory tract, sexually transmitted infections. Water, food and other environmental pathogens. Pathogenesis and virulence.

Current issues in Medical Microbiology – Epidemiology and public health microbiology:
Emerging and re-emerging pathogens: an evaluation of the re-emergence of illnesses to attempt to identify reasons for their return; consideration of the emergence of new pathogens and diseases. Vaccination and antimicrobial agents.

Part 3: Teaching and learning methods

Teaching and learning methods: The module will be delivered as a series of lectures, practical classes and tutorials.

Lectures introduce the biomedical science disciplines, and broad topics include the biological basis of infection and disease, diagnostic approaches, and the response of the body to disease. Lectures highlight the core principles and concepts of these topics and provide a framework for self-directed study.

Practical classes are closely aligned with the lecture content and corresponding biomedical science discipline. The practical classes build on lecture content and develop observational, analytical and interpretive skills relevant to the biomedical science discipline. Practical classes develop core biomedical science techniques (e.g. microbiological practice), an appreciation of relevant health and safety requirements (e.g. working at biological containment level 2) and the requirement for care and diligence in clinical diagnostic work.

Tutorials provide guidance and support for the Case Study assessment and associated practical classes, and guidance and revision support for the exam.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Describe the causes of a range of human diseases and explain their biological basis.

MO2 Discuss approaches to the investigation, identification and diagnosis of; non-infectious diseases, or presence of pathogenic / non-pathogenic microorganisms (bacteria, viruses, fungi, and parasites).

MO3 Explain the response of the body to disease.

MO4 Demonstrate competency in interpretation and analytical skills relevant to the biomedical science disciplines (Haematology and Transfusion, Clinical Biochemistry, Cellular Pathology and Oncology, Applied Immunology, Medical Genetics, Medical Microbiology).

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 hours

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/modules/usska7-30-1.html

Part 4: Assessment

Assessment strategy: Assessment will include the following:

Assessment Task 1: Case study
Written assessment (1500 words)

A written assessment with a 1500-word limit, based on the results and interpretation of a simulated case study. The clinical symptoms of an imaginary patient are provided for the simulated case, and a number of clinical tests and investigations are performed on samples from this patient in a series of practical classes. Students will be required to interpret results generated during the practical classes in order to correctly diagnose the patient's disease status. Students will develop their interpretation and analytical skills relevant to the biomedical science disciplines; as well as their understanding of the biological basis of disease, and how disease is investigated and diagnosed. Formative opportunities include example questions and data analysis exercises during the practical classes and supporting tutorials.

Assessment Task 2: Examination
Onsite written examination (2 Hours)

The onsite invigilated examination will be designed to assess the breadth and depth of understanding of lecture and practical content covered in the module. Students will be required to incorporate their understanding of the cause and biological basis of disease, the response of the body to disease, and how disease is investigated and diagnosed using approaches relevant to the biomedical science disciplines. Formative opportunities include example questions and supporting tutorials.

Assessment tasks:

Case Study (First Sit)
Description: Case Study: Written assessment (1500 words)
Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO4

Examination (First Sit)

Description: Onsite written examination (2 Hours)

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3

Case Study (Resit)

Description: Case Study: Written assessment (1500 words)

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO4

Examination (Resit)

Description: Onsite written examination (2 Hours)

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Biomedical Science {Foundation} [Frenchay] - WITHDRAWN MSci 2024-25

Biomedical Science {Foundation} [Frenchay] BSc (Hons) 2024-25

Biomedical Science {Foundation} [Frenchay] BSc (Hons) 2024-25

Biomedical Science [Frenchay] BSc (Hons) 2025-26

Biomedical Science [Frenchay] - WITHDRAWN MSci 2024-25

Biomedical Science [Frenchay] BSc (Hons) 2024-25

Biomedical Science [Frenchay] BSc (Hons) 2024-25

Biomedical Science [Frenchay] BSc (Hons) 2025-26