Module Specification

Infection and Disease

Version: 2022-23, v5.0, 15 Jul 2022

Contents

Part 1: Information

Module title: Infection and Disease

Module code: USSKA7-30-1

Level: Level 4

For implementation from: 2022-23

UWE credit rating: 30

ECTS credit rating: 15

Faculty: Faculty of Health & Applied Sciences

Department: HAS Dept of Applied Sciences

Partner institutions: None

Delivery locations: Frenchay Campus

Field: Applied Sciences

Module type: Standard

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: Not applicable

Features: Not applicable

Educational aims: This module aims to introduce the main disciplines in Biomedical Science: cellular pathology, clinical biochemistry, clinical immunology, haematology, transfusion science, clinical genetics and medical microbiology. As well as

developing an understanding of specific diseases and their laboratory investigation, you will be encouraged to integrate your knowledge in these core areas, providing a solid foundation for future system-led learning.

Outline syllabus:

Disease:

The nature of disease and fundamentals of pathology; including age- related diseases.

Haematology:

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.

Diseases of the liver and diabetes:

Causes of liver disease. Diabetes: types, prevalence and clinical presentation. Diagnosis of these diseases. Overview of biochemical markers of these diseases.

Carcinogenesis and neoplasia:

An introduction to the key concepts and common causes of neoplastic disease including the “Hallmarks of Cancer.” The mechanisms by which tumours are initiated including the function of oncogenes and tumour suppressors.

An introduction to nomenclature and the differences between benign and malignant tumours. Laboratory diagnostics will be covered along with prognostic indicators such as grade and stage, and the importance of metastasis in clinical outcome.

Acute and chronic inflammation:

An introduction to the inflammatory process at a tissue level and its systemic effects. The chemical mediators involved and their effects on tissue and vasculature.

Contrasting the acute and chronic inflammatory response and histological features of inflammatory conditions such as granulomas. Included will be an overview of the wound healing process and the role of inflammation and different cell types in resolving injury.

Cells and tissues of the immune system:
Antigens, antibodies, antigenicity, specificity, memory, tolerance and autoimmunity. Overview of cellular and humoral immunity.

Cellular injury and death:
The importance of cell death in normal physiological processes and as a response to injury. An introduction to apoptosis including the cellular mechanisms and both intrinsic and extrinsic stimuli. The process of autophagy and the importance of this and apoptosis in disease.

Cytogenetics and disease:
Clinical cytogenetics, karyotype analysis and phenotypic expression of genetic abnormality.

Atherosclerosis:
Cholesterol synthesis. Lipoprotein metabolism. The aetiology and pathogenesis of arterial disease, atherosclerosis.

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 key lectures and practical classes aligning to these. Lectures cover topics pertaining to the biological basis of infection and disease, highlighting the important principles and concepts of each topic and providing a framework for personal study. Practical classes, including a simulated case study, are designed to develop observational, analytical and interpretive skills, an appreciation of safety issues and the requirement for care, diligence and attention to detail in clinical diagnostic work. Core biomedical science techniques, including good microbiological practice, aseptic technique and working at biological containment level 2, will be developed.
Self-directed study will be used to encourage students to develop their understanding of the biology and pathology of disease.

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

MO1 Describe some of the major causes of non-infectious human disease and explain their biological basis.

MO2 Explain the basis of disease response mechanisms.

MO3 Discuss approaches to the investigation and diagnosis of selected non-infectious disease processes.

MO4 Appreciate the diversity of microorganisms, their ubiquity and basis of their identification.

MO5 Explain the importance of pathogenic bacteria, viruses, fungi and parasites in the context of Medical Microbiology.

MO6 Describe current understanding of some topical issues in microbiology.

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 hours

Total = 300

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:

Component A:
Written Examination (2 Hours)
The examination will be designed to assess the breadth and depth of understanding of lecture and practical material covered in the module.
Students will be supported in this assessment by bespoke revision tutorials.

Component B:

B1:

An 1000 word online written exercise based on the results and interpretation of a simulated case study of a patient who presents with clinical symptoms, and upon whose samples a number of clinical tests and investigations will have been performed in practical classes. The student will be required to interpret the results in order to correctly diagnose the patient's disease status. This will develop skills in the analysis and integration of data from a range of core clinical disciplines in order to determine an outcome.

B2:

Essay (500 words)

The essay will focus on a topical aspect of microbiology. The essay will be self-researched and will allow the student to develop their ability to recognise and search appropriate sources of scientific information, interpret data and write scientifically. These skills are key to the effective communication of science to an academic audience.

Preparation for both coursework elements will be supported by guided tutorial sessions.

Assessment components:

Examination - Component A (First Sit)
Description: 2 Hour Examination
Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6

Written Assignment - Component B (First Sit)
Description: Essay (500 words)
Weighting: 20 %
Final assessment: No

Group work: No
Learning outcomes tested: MO6

Case Study - Component B (First Sit)
Description: Case Study (1000 words)
Weighting: 30 %
Final assessment: No
Group work: No
Learning outcomes tested: MO3

Examination - Component A (Resit)
Description: 2 Hour Examination
Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6

Written Assignment - Component B (Resit)
Description: Essay (500 words)
Weighting: 20 %
Final assessment: No
Group work: No
Learning outcomes tested: MO6

Case Study - Component B (Resit)
Description: Case Study (1000 words)
Weighting: 30 %
Final assessment: No
Group work: No
Learning outcomes tested: MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Biomedical Science [Sep][FT][Frenchay][3yrs] BSc (Hons) 2022-23

Biomedical Science [Sep][SW][Frenchay][4yrs] BSc (Hons) 2022-23

Biomedical Science [Sep][SW][Frenchay][5yrs] MSci 2022-23

Biomedical Science [Sep][FT][Frenchay][4yrs] MSci 2022-23

Applied Biomedical Science [Sep][FT][Frenchay][3yrs] BSc (Hons) 2022-23

Healthcare Science (Genetic Science) [Sep][FT][Frenchay][3yrs] BSc (Hons) 2022-23

Healthcare Science (Infection Science) [Sep][FT][Frenchay][3yrs] BSc (Hons) 2022-23

Healthcare Science (Blood Science) [Sep][FT][Frenchay][3yrs] BSc (Hons) 2022-23

Healthcare Science (Tissue Science) [Sep][FT][Frenchay][3yrs] BSc (Hons) 2022-23

Biomedical Science {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2021-22

Biomedical Science {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2021-22

Biomedical Science {Foundation} [Sep][SW][Frenchay][6yrs] MSci 2021-22

Biomedical Science {Foundation} [Sep][FT][Frenchay][5yrs] MSci 2021-22

Healthcare Science (Blood Science) {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2021-22

Healthcare Science (Infection Science) {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2021-22

Healthcare Science (Tissue Science) {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2021-22

Healthcare Science (Genetic Science) {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2021-22

Biomedical Science [Sep][PT][Frenchay][6yrs] BSc (Hons) 2022-23

Biomedical Science [Sep][PT][Frenchay][8yrs] MSci 2022-23

Biomedical Science [Sep][PT][Frenchay][6yrs] BSc (Hons) 2021-22

Biomedical Science [Sep][PT][Frenchay][8yrs] MSci 2021-22