



## **Module Specification**

### **Studies in the Biology of Disease**

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## Part 1: Information

**Module title:** Studies in the Biology of Disease

**Module code:** USSKAT-30-2

**Level:** Level 5

**For implementation from:** 2024-25

**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:** Infection and Disease 2024-25

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** Yes

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** The Studies in the Biology of Disease module covers the role of a biomedical scientists and the knowledge required for the profession. This module closely aligns with the latest QAA benchmark statements (2023) and applies this knowledge in the context of specific disease and case studies.

**Features:** Not applicable

**Educational aims:** See Learning Outcomes.

**Outline syllabus:** Studies in the Biology of Disease is a pre-requisite for and underpins every Institute of Biomedical Science (IBMS) specialism module at Level 6. Successful completion of this module is mandatory for IBMS accreditation and moving on to level 6.

The first teaching block includes specialist lectures that closely align with the QAA benchmark statements. Disease examples will be used to explain the benchmark statements and how they relate to the role of a biomedical scientist. These sessions are supported by practicals that cover a range of IBMS portfolio skills that relate to the preceding specialist lectures. These practical sessions group relevant specialisms and cover infection sciences (Microbiology and Immunology), blood sciences (Haematology, Clinical Biochemistry, and Transfusion), and tissue sciences (Clinical Genetics and Cellular Pathology). The second teaching block then discusses pathology of organ systems as it relates to biomedical science. These sessions are then supported by practical case studies that provide an understanding of how multiple biomedical specialisms are required when diagnosing and understanding a clinical disease.

A detailed syllabus is provided as the module underpins IBMS accreditation. The indicative content includes:

**Cellular Pathology:** Content regarding Cellular Pathology includes (1) the gross structure and ultrastructure of normal cells and tissues and the structural changes which may occur during disease, (2) reproductive science, including infertility and embryology, (3) the preparation of cells and tissues for microscopic examination, and (4) the principles and applications of visualisation and imaging techniques, including microscopy, to aid diagnosis and treatment selection.

**Clinical Biochemistry:** Content regarding Clinical Biochemistry includes (1) the range of common methods used for the collection and analysis of clinical samples, (2) investigations of major body and organ systems - for example, renal function tests, liver function tests, tumour marker tests, bone profile tests, (3) the principles and applications of biochemical investigations used for screening, diagnosis, treatment and monitoring of disease, and (4) the therapeutic drug monitoring and investigation

of substance abuse.

Content regarding point-of-care testing includes (1) the principles and applications of investigations used in screening, diagnosis, treatment and monitoring of disease using Near Patient Testing (NPT) equipment, (2) the application of NPT into patient pathways, and (3) the relevant quality assurance considerations.

Clinical Immunology: Content regarding Clinical Immunology includes (1) the principles of the function and measurement of effectors of the immune response, (2) the causes and consequences of abnormal immune function, neoplastic diseases and transplantation reactions together with their detection, diagnosis, treatment and monitoring, and (3) principles and practice of immunological techniques used for screening, diagnosis, treatment and monitoring of disease prophylaxis and immunotherapy.

Haematology: Content regarding Haematology includes (1) the structure, function and production of blood cells, (2) the regulation of normal haemostasis, (3) blood cell morphology - identification of normal white blood cells and common red blood cell abnormalities, (4) nature and diagnosis of anaemias, haematological malignancies, haemorrhagic and thrombotic disease, and (5) principles and practice of haematological techniques used for screening, diagnosis, treatment and monitoring of disease.

Transfusion Science: Content regarding Transfusion science includes (1) interpretation of blood groups, causes of blood group anomalies, antibody screening, (2) the genetics, inheritance, structure and role of red cell antigens, (3) immune-mediated destruction of blood cells, (4) the preparation, storage and use of blood components, (5) the selection of appropriate blood components for transfusion and possible adverse effects, and (6) the patient blood management.

Clinical Genetics: Content regarding Clinical Genetics includes (1) genomic, transcriptomic, proteomic methods used to analyse and study human chromosomes and DNA, (2) the application of molecular biology and bioinformatics in medicine, (3) pharmacogenetics and personalised medicine, and (4) the principles and practice of

techniques used for genetic testing for screening, diagnosis and monitoring of disease, and associated ethical issues.

Medical Microbiology (including virology): Content regarding Medical Microbiology includes (1) the pathogenic mechanisms of a range of microorganisms, (2) public health microbiology (epidemiology and control of infectious diseases) and the concept of One Health, (3) principles and practice of techniques used for screening, diagnosis, treatment and monitoring of a range of infectious diseases, involving a range of methods to detect and identify microorganisms, prevention and control of infection, including vaccination, environmental and vector control, and (4) antimicrobial chemotherapy, antimicrobial resistance (antibiotics, antivirals, antifungals, anti-parasitics).

Professional: Content regarding the professional delivery of laboratory services includes (1) interpretation of quality control standards (QC), (2) importance of quality assurance and pre-analytical variables, (3) an understanding of the importance of external quality assessment (EQA), (4) quality management (to include basic knowledge of the purpose of quality policy, audits, standard operating procedures, training and competency documentation, error logging and incident reporting, validation and verification, and reagent inventories), and (5) laboratory accreditation (to include basic awareness of UK Accreditation Service (UKAS) and International Organisation for Standardisation (ISO) standards).

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** Teaching methods will incorporate both lectures and practicals. Lectures will be supported by practicals to extend and solidify knowledge. The module runs in two sections/teaching blocks, the first where the lectures review the QAA benchmark statements and give specific examples in the context of the biomedical science profession. These are then followed by practicals that allow students to apply specific IBMS portfolio skills in a safe setting. In the second section/teaching blocks, pathology of specific organ systems is discussed in lectures. These are then applied in a practical setting to demonstrate to students

how biomedical specialisms interact with regards to a specific case. The cases presented are a range of diseases outlined in the practical handbook.

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

**MO1** Apply knowledge of biomedical specialisms and the profession, as summarised by the latest version of the QAA benchmark statements, to specific disease scenarios.

**MO2** Discuss the pathophysiology responsible for disease and disorders in the human body including investigation and diagnosis of selected diseases.

**MO3** Integrate the specialist areas of biomedical science into the context of a coherent case study approach.

**MO4** Analyse and interpret data obtained in biomedical practice within a clinical case context.

**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](https://uwe.rl.talis.com/modules/usskat-30-2.html) via the following link <https://uwe.rl.talis.com/modules/usskat-30-2.html>

## **Part 4: Assessment**

**Assessment strategy:** Assessment 1:

Assessment 1 is a continuous professional development (CPD) coursework. Students will complete a paper-based study that contains true/false questions that assesses their understanding of the paper followed by two short answer questions

that link their reading of the paper to their understanding of biomedical science as a profession. This assessment is of a similar design to CPD currently found in the Biomedical Science journal.

#### Assessment 2:

Assessment 2 is a case study based coursework. Students will answer essay questions relating to a practical case study, which have been enhanced through integration of patient and end-user involvement. The aim of this assessment is to introduce students to the investigative nature of biomedical science and to demonstrate how the individual disciplines integrate and aid the differential diagnosis and understanding of specific cases.

Students are prepared for this assessment with a practical relating to the case study. Students are also given a practical book that contains similar style questions allowing them to prepare and develop understanding. Feedback from assessment 1 is specifically designed to help with the completion of assessment 2. Formative feedback is available to students throughout the module through group discussion at the end of practical classes and lectures.

#### Assessment 3:

Assessment 3 is an in-person case study based exam. The exam will contain questions relating to the course material, providing students with an opportunity to demonstrate both their knowledge on a broad range of topics, and more in-depth knowledge of the biomedical specialisms. Students will be assessed on the biomedical specialism knowledge in the context of a specific case study.

Students are provided with formative feed-forward for their exam through a revision and exam preparation session prior to the exam. Feedback from Assessment 2 is specifically designed to help with the completion of the exam. Questions similar in style to the exam are present in the practical book and the first sit exam will be one of the practicals completed in the module second teaching block.

**Assessment tasks:**

**Written Assignment (First Sit)**

Description: Continuous Professional Development Task

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1

**Case Study (First Sit)**

Description: Case Study Portfolio

Weighting: 35 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

**Examination (First Sit)**

Description: On campus, invigilated examination

Weighting: 40 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

**Written Assignment (Resit)**

Description: Continuous Professional Development Task

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1

**Case Study (Resit)**

Description: Case Study Portfolio

Weighting: 35 %

Final assessment: No



Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

**Examination (Resit)**

Description: On campus, invigilated examination

Weighting: 40 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

**Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Biomedical Science [Frenchay] BSc (Hons) 2023-24

Biomedical Science [Frenchay] MSci 2023-24

Biomedical Science {Foundation} [Frenchay] MSci 2022-23

Biomedical Science [Frenchay] MSci 2022-23

Biomedical Science {Foundation} [Frenchay] BSc (Hons) 2022-23

Biomedical Science [Frenchay] BSc (Hons) 2022-23

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

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