Module Specification

Research and Diagnostic Methodologies

Version: 2026-27, v2.0, Approved

Contents

Part 1: Information

Module title: Research and Diagnostic Methodologies

Module code: USSJYT-30-M

Level: Level 7

For implementation from: 2026-27

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 demonstrates how different methods can be applied in both the research and the diagnostic context in Biomedical Science.

Features: Not applicable

Educational aims: This module focuses on the theory that underpins scientific techniques and data analysis skills used in both research and diagnostics in the field of biomedical science.

You will also start applying ideas from this module to your research project.

Outline syllabus: Core technology relevant to all students reading for MSc in Biomedical Sciences:
Molecular biology
Electrophoresis
Microscopy

Students also learn methods that are relevant for their specialism. These are delivered as specialist methods such as:
Immunohistochemistry, immunocytochemistry, in-situ hybridisation
Immunoassays
Flow cytometry
Spectroscopy
Chromatography
Point of care testing
Gene sequencing

Principles of good experimental design.
Methods for the assessment of data quality and method validation.
Descriptive statistics.
Inferential statistics and hypothesis testing.
Statistical significance, variance, regression, covariance.
Selecting the appropriate statistical method.

Effective literature searching strategies.
Critical reading skills.
Scientific writing skills.
The peer review process as applied to research papers and grant applications.

Quality control in biomedical science
Principles of project management
Leadership skills for biomedical scientists

Evidence based medicine.
Introduction to bioethics.
An understanding of how Ethics Committees work.

Part 3: Teaching and learning methods

Teaching and learning methods: The module will have a mixture of lectures to cover the core scientific principles, supported by talks from researchers on the use of the core methods in the research sector. Coverage of the use of the scientific methods in the diagnostic sector will be supported by video presentations by diagnostic sector staff, and supported by visits to diagnostic laboratories where possible.

The statistics teaching will be by computer-based workshops.

This module provides theoretical underpinning to the Research Project module

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

MO1 Demonstrate an in-depth understanding of the theory that underpins a range of scientific methods and awareness of the application of them in both research and diagnostic settings including the evaluation of their role and limitations.

MO2 Review critically the scientific literature (including national standard methods and standard operating procedures) in relation to biomedical science methodological choices.

MO3 Select and perform appropriate statistical techniques for the analysis of experimental data.

MO4 Demonstrate a critical awareness of the principles of good experimental design in biomedical research.

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/ussjyt-30-m.html

Part 4: Assessment

Assessment strategy: Assessment 1 is a Set Exercise - a statistical analysis activity reflecting the importance of developing statistical skills ahead of the project. (2000-4000 words)

Assessment 2 is a Poster - a visual representation with a particular focus on critical analysis of literature on widely used experimental techniques with a Q&A approach to discuss the poster content (20 minutes)

During this module students undertake a formative activity in the form of a project proposal - this underpins the project module and will required for completion of research governance process before a student starts in the laboratory. The feedback from this formative activity will directly support project module assessment.

Students are supported on this module through written and verbal briefings given for each assessment. Within the MSc BMS programmatic approach to skills development they are also supported by workshops in Induction or other core modules that cover designing a poster, scientific writing, oral presentation skills, and analysis of published papers. Within the programme students are also guided in applying feedback from earlier assessments to later ones.

Assessment tasks:

Set Exercise (First Sit)

Description: Data interpretation exercise (2000-4000 words)
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO3

Poster (First Sit)
Description: Poster presentation with a particular focus on critical analysis of literature on widely used experimental techniques (20 minutes).
Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO4

Set Exercise (Resit)
Description: Data interpretation exercise (2000-4000 words)
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO3

Poster (Resit)
Description: Poster presentation with a particular focus on critical analysis of literature on widely used experimental techniques (20 minutes).
Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Biomedical Science [Frenchay] MSc 2025-26

Biomedical Science (Medical Microbiology) [Frenchay] MSc 2025-26

Biomedical Science (Medical Genetics) [Frenchay] MSc 2025-26

Biomedical Science (Cellular Pathology) [Frenchay] MSc 2025-26

Biomedical Science (Clinical Biochemistry) [Frenchay] MSc 2025-26

Biomedical Science (Immunology) [Frenchay] MSc 2025-26

Biomedical Science (Haematology) [Frenchay] MSc 2025-26

Biomedical Science [Frenchay] MSc 2026-27

Biomedical Science [Frenchay] MSc 2026-27

Biomedical Science (Cellular Pathology) [Frenchay] MSc 2026-27

Biomedical Science (Cellular Pathology) [Frenchay] MSc 2026-27

Biomedical Science (Clinical Biochemistry) [Frenchay] MSc 2026-27

Biomedical Science (Clinical Biochemistry) [Frenchay] MSc 2026-27

Biomedical Science (Haematology) [Frenchay] MSc 2026-27

Biomedical Science (Haematology) [Frenchay] MSc 2026-27

Biomedical Science (Immunology) [Frenchay] MSc 2026-27

Biomedical Science (Immunology) [Frenchay] MSc 2026-27

Biomedical Science (Medical Genetics) [Frenchay] MSc 2026-27

Biomedical Science (Medical Genetics) [Frenchay] MSc 2026-27

Biomedical Science (Medical Microbiology) [Frenchay] MSc 2026-27

Biomedical Science (Medical Microbiology) [Frenchay] MSc 2026-27

Biomedical Science (Medical Microbiology) [Frenchay] MSc 2026-27

Biomedical Science (Medical Microbiology) [Frenchay] MSc 2026-27

Biomedical Science (Medical Genetics) [Frenchay] MSc 2026-27

Biomedical Science (Medical Genetics) [Frenchay] MSc 2026-27

Biomedical Science (Immunology) [Frenchay] MSc 2026-27

Biomedical Science (Immunology) [Frenchay] MSc 2026-27

Biomedical Science (Haematology) [Frenchay] MSc 2026-27

Biomedical Science (Haematology) [Frenchay] MSc 2026-27

Biomedical Science (Clinical Biochemistry) [Frenchay] MSc 2026-27

Biomedical Science (Clinical Biochemistry) [Frenchay] MSc 2026-27

Biomedical Science (Cellular Pathology) [Frenchay] MSc 2026-27

Biomedical Science (Cellular Pathology) [Frenchay] MSc 2026-27

Biomedical Science [Frenchay] MSc 2026-27

Biomedical Science [Frenchay] MSc 2026-27