Module Definition Form (MDF)

Module code: MOD002888	**Version:** 2 **Date Amended:** 15/Oct/2014

1. Module Title
Specialist Topics in Biomedical Science

2a. Module Leader
Joseph Bird

2b. School
School of Life Sciences

2c. Faculty
Faculty of Science and Engineering

3a. Level
6

3b. Module Type
Standard (fine graded)

4a. Credits
15

4b. Study Hours
150

5. Restrictions

Type	Module Code	Module Name	Condition
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:	BSc (Hons) Biomedical Science		

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

This module builds on the sound underpinning knowledge of the key pathology disciplines that you have gained from previous study and is designed to impart a systematic knowledge of the theory, skills and techniques required of a graduate biomedical scientist. This knowledge will be extended to allow critical evaluation of the abnormal state and laboratory investigations for the prophylaxis, diagnosis, prognosis and therapeutic monitoring of disease through completion of a mock post mortem. Accordingly this module addresses the more specialist material and techniques from all four traditional pathology specialisms, namely: Cellular Pathology, Haematology and Transfusion Science and Medical Microbiology. Thus the module will consider theoretical and practical aspects of pathology through application of knowledge and practical skills in the post mortem investigations. Topics considered will includethe use of human tissues, including screening for disease, ensuring quality control, transfusion reactions and histocompatibility testing, specialist diagnostic tests for the isolation and identification of pathogens, (including the latest molecular techniques), prophylaxis and treatment regimes, special staining methods and immunocytochemical and histochemical techniques and their role in demonstrating particular cellular and tissue components and the identification of abnormal conditions, detailed investigation of function in major organ systems, effects of organ malfunction, or disease, on intermediary metabolism and homeostasis, theoretical underpinning of assay techniques and the role of automation in handling large workloads. Teaching will be delivered largely through group practical case work, where students will perform the role of the pathologist and biomedical scientist and collate information from identifying, measuring and weighing organs (pig plucks) followed by dissection and diagnosis of the most probable cause of death using routine and specialist diagnostic techniques. a Students will be supported through a mixture of lectures, seminars and regular formative feedback sessions. Students will be allocated groups and are expected to engage regularly with their peers and module tutor through attendance at every teaching session and also via the LMS discussion boards, tutorial work and directed self-learning. Teaching is supported by, and largely delivered by, professional (HPC-registered) staff at Addenbrooke's Hospital.

6b. Outline Content

- Specialised histochemical and immunocytochemical techniques for the demonstration, localisation and identification of carbohydrates, lipids, pigments, nucleic acids, proteins, connective tissues, enzymes and infective agents
- Specialised microscopy including electron microscopy
- Inborn errors of metabolism and biochemical markers of organ function and damage
- Application of key polices relating to pathology eg Human Tissue Act, Health and Safety At Work Act
- Blood gas and pH analysis, ion selective electrodes
- Endocrine system and its assessment, fertility testing.
- Therapeutic drug monitoring, drug analysis and the detection of drugs of abuse
- Anaemias classification, red cell morphological abnormalities; principles of macrocytic, microcytic and haemolytic anaemias
- Laboratory evaluation of disorders of haematopoiesis and haemostasis
- Blood & blood products: principles & practice; quality control including disease screening
- Pre-transfusion testing including compatibility testing & antibody detection;
- Transfusion & transfusion reactions, transplantation and histocompatibility testing
- Haemolytic disease of the neonate: pre-/post-partum testing, foetal maternal haemorrhage
- Typing and antibiotic resistance assays
- Molecular diagnostics including real time PCR and sequencing
- Prophylaxis and vaccinations including infections in immunocompromised hosts
- Epidemiology
- Critical evaluation and comparison of methods and problems and hazards associated with different methods
- Assay selection instrumentation and automation
- Application of key polices relating to pathology eg Human Tissue Act, Health and Safety At Work Act

6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

6d. Specialist Learning Resources
Students will have access to our specialist laboratories and equipment

7. Learning Outcomes (threshold standards)		
No.	**Type**	**On successful completion of this module the student will be expected to be able to:**
1	Knowledge and Understanding	Demonstrate a comprehensive and critical understanding of the principles underpinning the methods, techniques and instrumentation used in pathology laboratories.
2	Knowledge and Understanding	Demonstrate a critical understanding of the theoretical and practical aspects of compatibility testing used in transfusion and transplantation
3	Intellectual, practical, affective and transferrable skills	Critically apply knowledge of the normal structure and function of tissues and organ systems to the selection of appropriate techniques for the identification of disease, dysfunction, selection of prophylactic and therapeutic measures and their monitoring.
4	Intellectual, practical, affective and transferrable skills	Recognise the advantages and limitations of laboratory methods and techniques used in pathology laboratories and be able to critically evaluate performance of, techniques, assays and instruments and be able to identify and rectify causes of poor performance

8a. Module Occurrence to which this MDF Refers				
Year	**Occurrence**	**Period**	**Location**	**Mode of Delivery**
2026/7	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	**Hours**	**Learning Outcomes**	**Details of Duration, frequency and other comments**
Lectures	15	1-4	5 x 3hr lectures
Other teacher managed learning	21	1-4	6 x 3hr practical sessions and 1 x 3 hour mock court room session
Student managed learning	114	1-4	122 to 114 and add background reading and research for the case and engagement with critical group discussions on the VLE discussion board
TOTAL:	150		

9. Assessment for the above Module Occurrence

The assessment for some modules includes a presentation (see below for details on how this particular module is assessed). We recognise that presenting, especially to a large group, can cause significant anxiety or distress for some students. If this may affect you, please contact your Module Leader or the Disability and Neurodiversity Service as early as possible. We will work with you to consider appropriate reasonable adjustments. Depending on your individual needs, these might include, for example, presenting to a smaller group or presenting only to a member of academic staff.

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
010	Practical	1-3	60 (%)	Fine Grade	30 (%)
Mock Court Presentation; 1500 words					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
011	Examination Cambridge	4	40 (%)	Fine Grade	30 (%)
Examination; 1 hour 30 mins exam					

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:
(a) achieve the qualifying mark for each element of fine graded assessment as specified above
(b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]