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Module specification

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Module Code	SCI727
Module Title	Analytical and Molecular Techniques in Biomedical Sciences
Level	7
Credit value	20
Faculty	FAST
HECoS Code	100265
Cost Code	GAFS

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
MSc Biomedical Science	Core
Postgraduate Certificate Biomedical Science	Option
MRes Applied Biomedical Sciences Research	Core

Pre-requisites

N/A

Breakdown of module hours

Learning and teaching hours	3 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	18 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	21 hrs
Placement / work based learning	0 hrs
Guided independent study	179 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	17/8//23
With effect from date	1/9/23
Date and details of revision	
Version number	1

Module aims

This module will enable students to:

Understand the various foundational theories on which the current Biomedical Laboratory principles and procedures function.

Help create a clear appreciation of the relevance, scope and limitations of a range of analytical and molecular techniques used in the biomedical sciences.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Critically evaluate the theoretical principles underlying various analytical procedures and molecular techniques used in pathology laboratories.
2	Critically analyse the practical limitations, performance, effectiveness and potential impact and importance of various analytical and molecular techniques.
3	Apply enhanced knowledge to understand, interpret and critically analyse analytical and molecular data obtained from using various laboratory techniques.
4	Develop and use advanced practical laboratory skills in biomedical science.

Assessment

Indicative Assessment Tasks:

Assessment 1 – Laboratory report (3000 words) using data generated during the practical sessions (and/or example data as appropriate).

Assessment 2 – Poster presentation (1000 words equivalent) covering guided independent study topics.

Assessment 3 - Students will be formatively assessed in their laboratory skills. Attendance for a minimum of 70% of the supervised learning hours is therefore required.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1, 3	Written Assignment	75%
2	2	Presentation	25%

| 3 | 4 | Attendance | Pass/Fail |

Derogations

N/A

Learning and Teaching Strategies

Strategies used in this module will involve a blend of several higher education teaching and learning methods. These will include lectures, practical classes, tutorials, case studies and student-led presentations. On-line learning will consist of a combination of videos, contribution to fora, quizzes, weekly check-ins and online interactive resources for techniques and equipment not used during the practical sessions. Several sources of information (*e.g.* literary books, online literature, web sites) will also be available for students.

Indicative Syllabus Outline

- Advanced laboratory skills
- Gel electrophoresis and immunoblotting
- Tissue culture and molecular/cell isolation methods
- Molecular biology techniques (*e.g.* PCR)
- Flow cytometry and microscopy
- Immunoassays (ELISA)
- Point of care testing (POCT)
- Genomics and personalised medicine
- Specialist Biomedical laboratory equipment (*e.g.* Indiko auto-analyaser, Biomerieux Mini-vidas)
- Automation, COSHH, Risk Assessments, Standard Operating Procedures (SOPs)

Indicative Bibliography:

Essential Reads

Nessar Ahmed, N., Glencross, H., Wang, Q. (Eds.) (2022), *Biomedical Science Practice: Experimental & Professional Skills.* 3rd ed. Oxford: Oxford University Press.

Other indicative reading

Skoog, D.A., Holler, F.J. and Nieman, T.A. (Eds.) (2017), *Principles of Instrumental Analysis.* 7th ed. London: Cengage Learning.

Hofmann, A and Clokie, S. (Eds) (2018), *Wilson and Walker's Principles and Techniques of Biochemistry and Molecular Biology.* 8th ed. Cambridge: Cambridge University Press.

Employability – the University Skills framework

Each module and programme is designed to cover core Graduate attributes with the aim that each Graduate will leave the University having achieved key employability skills as part of

their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas.

Core Attributes
Engaged
Enterprising
Creative
Ethical

Key Attitudes
Commitment
Curiosity
Resilience
Adaptability

Practical Skillsets
Digital Fluency
Organisation
Leadership and Team working
Critical Thinking
Communication