Module Definition Form (MDF)

Module code: MOD007185	**Version:** 6 **Date Amended:** 06/Dec/2023

1. Module Title
Laboratory Techniques in DNA Manipulation (BMS)

2a. Module Leader
Harisree Paramel Nair

2b. School
School of Life Sciences

2c. Faculty
Faculty of Science and Engineering

3a. Level
5

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

Practical laboratory skills are essential for a wide variety of careers available to BSc (Hons) Biomedical Science graduates. You will develop your competency and experience in a wide variety of laboratory skills essential to anyone working in a laboratory.

You will gain the knowledge and understanding of basic practical laboratory techniques (such as laboratory-based maths skills, pipetting, weighing chemicals, and making solutions). You will gain experience and insight into the manipulation and analysis of DNA in silico using contemporary bioinformatics techniques, and will apply this knowledge in the laboratory, where you will clone genes and express proteins. You will conduct experiments and analyse and quantify your results, and will be monitored on your practical competency, and the ability to document your work.

A key part to this module is to educate you in Good Laboratory Practice (GLP) and instruction in health and safety practices that are required of biomedical scientists in research and clinical laboratories. You will also develop key employability skills through taking part in activities such as presenting data, computing skills, organising your work, managing time, and working in both a team environment and as an individual.

On completing this module you will be equipped with a variety of skills that will assist you in different laboratory-based areas, including bioinformatics, clinical biomedical science, research laboratory work, or in biotechnology companies

6b. Outline Content

- Experience and an assessment of basic laboratory practical skills
- Experience of theoretical and practical mathematical skills, concepts of molarity, scientific notation
- Application of molecular biology and bioinformatics in medicine
    - Genetic disorders with biomedical significance
- A series of molecular biology experiments, involving PCR,molecular cloning, protein expression and analysis by SDS-PAGE
    - Control of microorganisms
- A Restriction Fragment Length Polymorphism (RFLP) experiment

6c. Key Texts/Literature

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

6d. Specialist Learning Resources

- Specialist laboratories and laboratory equipment including
- Thermocyclers
- Centrifuges
- Agarose gel electrophoresis equipment
- SDS-polyacryladmide gel electrophoresis equipment
- Microbiology incubators
- Fume hoods

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	Critically evaluate health and safety considerations in a laboratory environment
2	Knowledge and Understanding	Accurately, safely and appropriately perform a range of DNA-based laboratory techniques and generate, analyse, interpret and present experimental data
3	Intellectual, practical, affective and transferrable skills	Manipulate and analyse bioinformatic data to address specific experimental questions
4	Intellectual, practical, affective and transferrable skills	Apply detailed theoretical and practical knowledge of mathematical skills, concepts of molarity, scientific notation to the analysis of laboratory data

8a. Module Occurrence to which this MDF Refers

Year	Occurrence	Period	Location	Mode of Delivery
2025/6	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	0	None	None
Other teacher managed learning	36	1,2,3,4	9 x 3 hrs lab practical sessions + 2 x 3 hrs computer session + 1 x 3 hrs practical assessment
Student managed learning	114	1,3,4	Background reading, online activities, preparation for lectures and practicals, and completion of assessments
TOTAL:	150		

9. Assessment for the above Module Occurrence					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
010	Coursework	1-3	60 (%)	Fine Grade	40 (%)
Lab Report (1500 words equivalent) and in-class practical assessment (500 words equivalent) (40% Qualifying Mark as stipulated by the IBMS)					

Assessment components for Element 010				
Component No.	**Assessment Title**	**Submission Method**	**Weighting (%)**	**Components needed for Mark Calculation?**
010/1	Lab Report	Canvas	70 (%)	All
010/2	In-class practical assessment	Scheduled Activity: Timetabled assessment task	30 (%)	

Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
011	Practical	2,4	40 (%)	Fine Grade	40 (%)
Practical assessment quiz (1000 words equivalent) (40% Qualifying Mark as stipulated by the IBMS)					

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]