



MODULE SPECIFICATION

Academic Year (student cohort covered by specification)	2024-25
Module Code	3131
Module Title	Molecular Biology & Recombinant DNA Techniques
Module Organiser(s)	Dr Martin C. Taylor
Faculty	Infectious & Tropical Diseases
FHEQ Level	Level 7
Credit Value	CATS: 15 ECTS: 7.5
HECoS Code	100265:100345 (1:1)
Term of Delivery	Term 2
Mode of Delivery	For 2024-25 this module will be delivered by face-to-face teaching modes. Where specific teaching methods (lectures, seminars, discussion groups) are noted in this module specification these will be delivered by face-to-face sessions. There will be a combination of live and interactive activities (synchronous learning) as well as recorded or self-directed study (asynchronous learning), plus face-to-face laboratory classes.
Mode of Study	Full-time
Language of Study	English
Pre-Requisites	It is expected that all students will have a basic theoretical understanding of nucleic acids, gene expression and protein synthesis. This module's content is coordinated with Advanced Training in Molecular Biology (3158).
Accreditation by Professional Statutory and Regulatory Body	None
Module Cap (Indicative number of students)	20 (numbers may be capped due to limitations in facilities or staffing)
Target Audience	This module is intended for all students who require theoretical knowledge and practical experience of standard molecular biology techniques. It is not recommended for those with significant previous experience of these techniques.



Module Description	This module covers basic techniques in DNA manipulation including PCR amplification from genomic DNA, DNA cloning, plasmid preparation and DNA sequencing. It also includes sessions on bioinformatic analysis of DNA sequence data. The second component involves understanding and interpretation of scientific papers.
Duration	5 weeks at 2.5 days per week
Timetabling slot	Slot C1
Last Revised (e.g. year changes approved)	July 2024

Programme(s)	Status
This module is linked to the following programme(s)	
MSc Medical Microbiology	Recommended
MSc Medical Parasitology	Recommended

Module Aim and Intended Learning Outcomes

Overall aim of the module
The overall module aim is to: <ul style="list-style-type: none"> provide a basic understanding and practical experience of a range of reagents and methods that are the essential tools of the molecular biologist.

Module Intended Learning Outcomes
Upon successful completion of the module a student will be able to: <ol style="list-style-type: none"> Demonstrate knowledge and understanding of the principles underpinning important techniques in molecular biology; Demonstrate knowledge and understanding of some applications of these techniques in laboratory research on infectious diseases; Demonstrate the ability to carry out laboratory experiments in molecular biology and bioinformatic analyses, and interpret the results; Demonstrate the ability to read, comprehend and assess the relevant scientific literature.

Indicative Syllabus

Session Content

The module is expected to cover the following topics:

- PCR (lecture and practical);
- DNA cloning (lecture and practical);
- Bacterial transformation (lecture and practical);
- Plasmid DNA purification (lecture and practical);
- Restriction digestion analysis of DNA (lecture and practical);
- DNA sequencing (lecture and practical);
- Sequence analysis (lecture and practical);
- Genomics and genome editing technology (lectures).

Teaching and Learning

Notional Learning Hours

Type of Learning Time	Number of Hours	Expressed as Percentage (%)
Contact time	35	23%
Directed self-study	10	7%
Self-directed learning	51.5	34%
Assessment, review and revision	53.5	36%
Total	150	100

Student contact time refers to the tutor-mediated time allocated to teaching, provision of guidance and feedback to students. This time includes activities that take place in face-to-face contexts such as lectures, seminars, demonstrations, tutorials, supervised laboratory workshops, practical classes, project supervision as well as where tutors are available for one-to-one discussions and interaction by email.

The division of notional learning hours listed above is indicative and is designed to inform students as to the relative split between interactive and self-directed study.

Teaching and Learning Strategy

There will be a range of teaching methods including laboratory practicals, bioinformatics computing practicals, lectures and group work. Approximately 40% of contact time is devoted to practicals, 20% to lectures, and the remainder to group work and revision sessions. There also will be several full and half days set aside for private study.

Assessment

Assessment Strategy

The assessment for this module has been designed to measure student learning against the module intended learning outcomes (ILOs) as listed above. The grade for summative assessment(s) only will go towards the overall award GPA.

The assessment(s) for this module will be online.

There will be two components to the assessment:

1. Practical results (including bioinformatic analyses) will be written up (as answers to a specific set of questions, NOT in scientific paper format) and assessed to evaluate understanding of the practical portion.
2. A timed short answer written test will be held at the end of the module to evaluate scientific literature comprehension.

The grades for each component will be equally weighted and combined to give an overall GPA; written feedback is given on both.

Summative Assessment

Assessment Type	Assessment Length (i.e. Word Count, Length of presentation in minutes)	Weighting (%)	Intended Module Learning Outcomes Tested
Timed Test (in-module test)	2 hours	50	2 & 4
Practical Write-up, submitted online	4 to 5 pages (including figures)	50	1 & 3

Resitting assessment

Resits will accord with [Chapter 8a](#) of the LSHTM Academic Manual

The re-sit will be an exam based on lecture content from the module and a journal article comprehension exam.

Assessment being replaced	Approved Alternative Assessment Type	Approved Alternative Assessment Length (i.e. Word Count, Length of presentation in minutes)
Practical Write-up	Exam based on lecture content	2 hours



Resources

Indicative reading list

Gene cloning and DNA analysis by T.A. Brown (Blackwell).

Teaching for Disabilities and Learning Differences

The module-specific site on Moodle gives students access to lecture notes and copies of the slides used during the lecture. Where appropriate, lectures are recorded and made available on Moodle. All materials posted on Moodle, including computer-based sessions, have been made accessible where possible.

LSHTM Moodle is accessible to the widest possible audience, regardless of specific needs or disabilities. More detail can be found in the [Moodle Accessibility Statement](#) which can also be found within the footer of the Moodle pages. All students have access to "SensusAccess" software which allows conversion of files into alternative formats.

Student Support Services can arrange learning or assessment adjustments for students where needed. Details and how to request support can be found on the [LSHTM Disability Support pages](#).