

Title of Programme: MSc Bioscience

Programme Code: LMBIOM

Course Code: LMMBM, LMMBME

MSc Molecular Biotechnology (Revised 2024)

MSc Molecular Biotechnology – Extended (Revised 2024)

Programme Specification

This programme specification is relevant to students entering:
23 September 2024

Associate Dean of School (Academic Quality Assurance):
Stefanie Schmeer

Stefanie Schmeer

Signature

A programme specification is a collection of key information about a programme of study (or course). It identifies the aims and learning outcomes of the programme, lists the modules that make up each stage (or year) of the programme, and the teaching, learning and assessment methods used by teaching staff. It also describes the structure of the programme, its progression requirements and any programme-specific regulations. This information is therefore useful to potential students to help them choose the right programme of study, to current students on the programme, and to staff teaching and administering the programme.

Summary of amendments to the programme

Date	Section	Amendment

If you have any queries regarding the changes please email AQO@herts.ac.uk

Programme Specification MSc Medical Microbiology

This programme specification (PS) is designed for prospective students, enrolled students, academic staff and potential employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the teaching, learning and assessment methods, learning outcomes and content for each module can be found in Definitive Module Documents (DMDs) and Module Guides.

Section 1

Awarding Institution/Body	University of Hertfordshire
Teaching Institution	University of Hertfordshire
University/partner campuses	College Lane
Programme accredited by	Not applicable
Final Award (Qualification)	MSc
All Final Award titles	MSc Molecular Biotechnology
(Qualification and Subject)	MSc Molecular Biotechnology (Sandwich) MSc Molecular Biotechnology with Advanced Research
FHEQ level of award	7

A. Programme Rationale

The programme is designed to provide a postgraduate education in Molecular Biotechnology for graduates in the Biosciences or Biological Chemistry. A strong practical foundation is provided in the first semester with the study of modules that concentrate on the basic principles and techniques used in modern molecular biology investigations, and on aspects of cellular molecular biology, immunology and development. In the second semester there is a progression to problem-based learning (PBL) to develop an in-depth understanding and high-level critical analysis skills of molecular biological approaches to the application of genome technology and production of industrial and medicinal proteins, the characterisation of selected diseases and the design of new biological drugs for their treatment. During the final semester, the research project carried out in the state-of-the-art multimillion science facility may include aspects of molecular biology, bioinformatics, vaccine, general cellular molecular biology, plant and animal biotechnology. This course will provide students with the skills they need to have for future opportunities in the fast-growing biotechnology industry. The MSc Molecular Biotechnology (Sandwich) pathway provides students with the opportunity to gain practical experience in a UK professional workplace and strengthens their employability skills. The MSc Molecular Biotechnology with Advanced Research provides an opportunity to work in a research rich environment, including the completion of an internship with a member of the research staff and an extended research project.

All options will provide students with the skills they need to have for future opportunities in the fast-growing biotechnology industry and academia.

The use of problem-based learning approaches is a key feature of the programme and will promote development of investigative skills, the ability to work in a group and confidence in the investigation of new research areas. Another key feature of the programme is the research project which provides training in research methods and hands-on experience of laboratory and bioinformatics techniques including next generation sequencing. Throughout the programme the students will be provided with academic and personal support by their personal tutors, programme leader and academic support unit. Where required, students will be further supported to improve their skills in academic English writing through English language classes.

B. Educational Aims of the Programme

Diversity and Inclusion

Our programmes are purposefully designed to enable all students to engage meaningfully with the curriculum by being accessible and representative. We will support students to shape their learning experience, removing

barriers and enabling them to succeed. The curriculum explicitly includes multiple and representative perspectives, valuing collective identities and individual diversity. Learning, teaching and assessment activities help students to understand how they can enhance outcomes both for themselves and for others. All students belong to a learning community, and during their studies we really want to hear their voices, encourage them to listen to others, and express themselves.

The programme has been devised in accordance with the University's graduate attributes of programmes of study as set out in [UPR TL03](#).

Additionally this programme aims to:

- engender a continuing and independent approach to learning, encouraging initiative and self-discipline such that students will be able to comprehend, contribute to, and harness advances in molecular biology;
- build and improve on students' cognitive skills, including the ability to think logically and independently; to be reflective and critical of scientific hypotheses, to analyse, synthesise and be creative;
- enable students to develop a systematic understanding and a critical awareness of associated issues, some of which are at the forefront of molecular biology;
- provide a framework for the acquisition of a comprehensive understanding of molecular biology techniques applicable to research, equivalent advanced scholarship and commercial situations;
- develop an ability to apply the techniques described above and an understanding of how the results may be used to inform judgements, and develop and advance ideas;
- provide opportunities for the continuing development of transferable skills including communication, mathematical analysis, use of information technology, problem solving both as part of a team and as an individual.

Graduate Attributes

Our graduates will be capable and professional, creative and enterprising, and will build their social and global awareness throughout. In addition to their subject expertise and proficiency, as a University of Hertfordshire graduate, they will be:

- Professionally focused
- Globally minded
- Sustainability driven
- Digitally capable and confident
- Inclusive and collaborative
- Evidence based and ethical

C. Intended Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills and other attributes in the following areas. The programme outcomes are referenced the Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (2014) and relate to the typical student. Additionally, the SEEC Credit Level Descriptors for Further and Higher Education (2021) have been used as a guiding framework for curriculum design.

Knowledge and Understanding:	Teaching/learning methods & strategies	Assessment
A1-Develop advanced knowledge and understanding to relate gene expression to the phenotype of an organism via an understanding of gene and protein structure and function, developmental biology and the influence of the environment on gene expression.	Acquisition of A1 and A2 is through a combination of lectures, laboratory classes, tutorials and guided reading in <i>Molecular Cell Biology and Immunology</i> and <i>Core Genetics and Protein Biology</i> . These outcomes will also be reinforced and developed in the problem-based learning (PBL) exercises in semester B.	Knowledge and understanding are assessed through a combination of unseen tests (A1- A4) data interpretation exercises (A3, A4) oral presentations (A1, A2), laboratory records (A1, A2), <i>viva voce</i> examinations (A3, A4), PBL assignments (A3, A4), and the design, execution and reporting of a research project (A2 - A4).
A2-Develop advanced knowledge and understanding to critically	A3 is achieved through the lecture programme, and problem-based learning (PBL) exercises in <i>Applied Biotechnology</i> .	

<p>evaluate the methodologies of gene mapping, recombinant DNA technology and introductory bioinformatics and apply them to the investigation and deconstruction of biological systems.</p> <p>A3-Develop advanced knowledge and understanding to appreciate the nature and application of biopharmaceuticals and understand the molecular mechanisms underlying protein engineering, production and purification, thus enabling the design of such processes.</p> <p>A4-Develop advanced knowledge and understanding to evaluate the molecular mechanisms that underpin selected inherited, non-inherited and infectious human diseases and understand the molecular strategies in developing therapeutics.</p>	<p>A4 is achieved through the lecture programme, and problem-based learning (PBL) exercises in <i>Genome Science</i>.</p> <p>Throughout, the learner is encouraged to undertake independent study both to supplement and consolidate what is being taught/learned and to broaden their individual knowledge and understanding of the subject.</p>	
Intellectual skills:	Teaching/learning methods & strategies	Assessment
B1-Evaluate the applications of molecular methods in fundamental research and industry.	Acquisition of B1 is through laboratory classes, <i>Research Project with Research Methods</i> , and PBL exercises.	Intellectual skills are assessed through laboratory reports, <i>viva voce</i> examinations, the Research Project and Extended Research Project, research internship portfolio and PBL assignments or placement report.
B2-Demonstrate a critical approach in enquiry and hypothesis testing and critically evaluate scientific literature and experimental data.	Acquisition of B2 is through the <i>Research Project with Research Methods</i> , <i>Extended Research Project</i> , PBL exercises and in <i>Genetics and Protein Biology</i> .	
B3-Integrate research skills, analytical and critical skills in a research internship and an extended project.	Acquisition of B3 is through the <i>Research Internship</i> and <i>Extended Research Project</i> .	
B4-Integrate theoretical and practical skills in a professional working environment.	Acquisition of B4 is through the <i>MSc Biosciences Placement</i> .	
Practical skills:	Teaching/learning methods & strategies	Assessment
C1-Design, execute, interpret and report investigations	Practical skills are developed through laboratory classes, the <i>PBL</i>	Practical skills are assessed through laboratory reports <i>viva</i>

(practical and theoretical) of molecular biology problems and molecular genetics of disease, critically evaluate the contribution made to current knowledge and propose avenues for future study.	<i>exercises, Research Project with Research Methods, Extended Research Project</i> and the work placement modules.	<i>voce</i> examinations the PBL assignments, the project proposal and project.
Transferable skills:	Teaching/learning methods & strategies	Assessment
D1-Effectively communicate analyses of case studies in both the written and spoken word and defend the findings of their work.	Transferable skills are developed throughout the programme: Acquisition of D1 is achieved in the PBL modules and <i>Research Project with Research Methods, Extended Research Project</i> .	Transferable skills are assessed through laboratory reports (D1, D4); <i>viva voce</i> examinations (D1 and D2); seminars (D1), PBL reports (D1, D3, D4, D5) and the project reports and research internship and placement reports (D1, D2, D4, D5, D6 and D7).
D2-Demonstrate self-direction and originality in tackling and solving problems and act autonomously in planning and executing tasks.	Acquisition of D2 is through the project, PBL and the supporting mentoring programme operated in Semester A.	
D3-Contribute effectively to the functioning of a group and reflect on the learning experience.	Acquisition of D3 is achieved through the PBL modules Acquisition of D4, D5, D6, D7 is through all modules but particularly the PBL exercises, bioinformatics	
D4-Demonstrate numeracy and manipulate, analyse and present data.	practicals in <i>Molecular Cell Biology and Immunology</i> , the <i>Research Project with Research Methods</i> module, the <i>Extended Research Project module</i> and the work placement modules.	
D5-Apply appropriate information technology to the recovery, analysis and reporting of data.	Throughout, the learner is encouraged to develop transferable skills by maintaining a record of evidence and completing a personal development plan.	
D6-Continue to learn independently and to develop professionally.		
D7-Communicate effectively, with colleagues and a wider audience.		

D. Programme Structures, Features, Levels, Modules, and Credits

The programme is offered in full-time mode (Semester A intake, 3 semesters) or as a part-time programme (Sem A intake, 6 semesters) and leads to the award of MSc Molecular Biotechnology. Entry is normally at level 7.

The programmes of study leading to the awards of MSc Molecular Biotechnology (Sandwich) and MSc Molecular Biotechnology with Advanced Research are offered in full-time (2 years) mode (Semester A intake, 6 semesters) only. Entry is normally at level 7.

Professional and Statutory Regulatory Bodies

N/A

Work-Based Learning, including Sandwich Programmes

The Sandwich award requires the successful completion of a minimum of 30 weeks full-time equivalent placement activity in addition to the period of academic study required.

The work placement comprises an agreed period of a minimum of 30 weeks full-time equivalent (including employers' and statutory holidays) of work-based learning at an organisation or company which has agreed to those terms and conditions regarded as essential by the University of Hertfordshire. Students will be supervised according to University regulations. The learning experience will be assessed in the 'Work Placement Assessment' module, to enable students to demonstrate both their knowledge of the industry, their skills development and their professional attributes.

Placements are advertised through the Careers and Employment Office. Students may also source their own placement, but it must be subsequently approved by the School in terms of health and safety, equality legislation and supervisory guidelines before a student can take it up. The placement will need to take place in the UK.

Depending on the nature of placement, a successful enhanced Disclosure and Barring check or equivalent, immunisation and occupational health check may be required.

All students on the pathway leading to the award MSc Molecular Biotechnology (Sandwich) are eligible to proceed to a placement year provided they have achieved 60 credits by the end of semester A and a further 60 credits by the end of semester B, and they have completed the appropriate placement documentation. Success in the placement will be recognised in the title of the award.

Programme Structure

The programme structure and progression information below (Table 1a and 1b) is provided for the award. Any interim awards are identified in Table 1b. The Programme Learning Outcomes detailed above are developed and assessed through the constituent modules. Table 2 identifies where each learning outcome is assessed.

Table 1a Outline Programme Structure

MSc Molecular Biotechnology

Mode of study Full-Time (one year)

Entry point Semester A

Module Title	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Molecular Cell Biology and Immunology	7LMS0279	30	30	0	40	30	A
Genetics and Protein Biology	7LMS0269	30	30	0	70	0	A
Applied Biotechnology	7LMS0273	30	30	0	70	0	B
Genome Science	7LMS0276	30	30	0	70	0	B
Research Project with Research Methods	7LMS0278	60	20	0	80	0	ABC, C*

The award of MSc Molecular Biotechnology requires 180 credit points passed at level 7.

* In exceptional circumstances and only in agreement with the Programme Leader students may be able to study the *Research Project with Research Methods* module in semester C.

MSc Molecular Biotechnology

Mode of study Part-Time (two years)

Entry point Semester A

Students study 60 credits in Year 1 and 120 credits in Year 2. An exemption to the University Policies and Regulations (UPR's) has been granted for students to complete 120 credits in Year 2.

Year 1 (60 credits)

	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Optional Modules							
Module Titles							
Molecular Cellular Biology and Immunology	7LMS0279	30	30	0	40	30	A
Genome Science	7LMS0276	30	30	0	70	0	B

Year 2 (120 credits)

	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Module Title							
Genetics and Protein Biology	7LMS0269	30	30	0	70	0	A
Applied Biotechnology	7LMS0273	30	30	0	70	0	B
Research Project with Research Methods	7LMS0278	60	20	0	80	0	ABC

The award of MSc Molecular Biotechnology requires 180 credit points passed at level 7.

MSc Molecular Biotechnology (Sandwich)

Mode of Study Full-Time (two years)

Entry point Semester A

Students study 135 credits in year 1 and 105 credits in year 2:

Year 1 (135 credits)

	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Module Title							
Molecular Cell Biology and Immunology	7LMS0279	30	30	0	40	30	A
Genetics and Protein Biology	7LMS0269	30	30	0	70	0	A
Applied Biotechnology	7LMS0273	30	30	0	70	0	B
Genome Science	7LMS0276	30	30	0	70	0	B
Research Methods	7LMS2112	15	100	0	0	0	AB

To progress to a placement, students on the 'Sandwich' award must normally have completed 135 credits. Students who have not met these progression requirements, including students with outstanding deferrals, will be transferred from the 'Sandwich' award to the two-year 'with Advanced Research' programme. In exceptional circumstances and only in agreement with the Programme Leader students may be able to transfer to the one-year route to complete their studies.

Year 2 (105 credits)

	Module Code	Credit Points	%Test	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Module Title							
MSc Biosciences Placement Year	7LMS2114	60	0	0	P/F	0	AB
Work Placement Assessment	7LMS2003	0	0	0	P/F	0	C
Research Project for Sandwich Route	7LMS2113	45	0	0	100	0	BC

The award of MSc Molecular Biotechnology (Sandwich) requires 240 credit points passed at level 7, with successful completion of the required placement activity and the *Work Placement Assessment* module.

MSc Molecular Biotechnology with Advanced Research

Mode of Study Full-Time (two years)

Entry point Semester A

Students study 135 credits in Year 1 and 105 credits in Year 2:

Year 1 (135 credits)

	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Module Title							
Molecular Cell Biology and Immunology	7LMS0279	30	30	0	40	30	A
Genetics and Protein Biology	7LMS0269	30	30	0	70	0	A
Applied Biotechnology	7LMS0273	30	30	0	70	0	B
Genome Science	7LMS0276	30	30	0	70	0	B
Research Methods	7LMS2112	15	100	0	0	0	AB

Year 2 (105 credits)

	Module Code	Credit Points	% Test	% Examination	% Coursework	% Practical	Semesters
Compulsory Modules							
Module Title							
Research Internship in Biosciences	7LMS2004	30	0	0	70	30	A
Extended Research Project	7LMS2005	75	0	0	100	0	ABC

The award of MSc Molecular Biotechnology with Advanced Research requires 240 credit points passed at level 7, with successful completion of the *Research Internship in Biosciences* and *Extended Research Project* modules.

Table 1b Final and interim awards available

The programme provides the following final and interim awards:

Final Award	Award Title	Minimum requirements	Available at end of (normally):	Programme Learning Outcomes developed (see above)
MSc	Molecular Biotechnology	180 credit points including at least 150 at level 7	3 Semesters	All programme learning outcomes except B3 and B4 (see Table 2)
MSc	Molecular Biotechnology with Advanced Research	240 credit points	6 Semesters	All programme learning outcomes except B4 (see Table 2b)
MSc	Molecular Biotechnology (Sandwich)	240 credit points including at least 150 at level 7	6 semesters	All programme learning outcomes except B3 (see Table 2a)

Interim Award	Award Title	Minimum requirements	Available at end of Level	Programme Learning Outcomes developed (see above)
MSc	Molecular Biotechnology Studies	180 credit points including at least 150 at level 7	5-6 Semesters	All programme learning outcomes except either B3 or B4 (see Table 2)
Postgraduate Diploma	Molecular Biotechnology	120 credit points, including at least 90 at level 7	2, 3 Semesters	A1, A2, A3, A4, B1, B2, C1, D1, D2, D3, D4, D5
Postgraduate Certificate		60 credit points, including at least 45 at level 7	1-2 Semesters	<i>For untitled awards:</i> See UPR AS11, section 13: http://sitem.herts.ac.uk/secreg/upr/AS11.htm

Masters and Diploma awards can be made "with Distinction" or "with Commendation" where criteria as described in [UPR AS14](#), Section D and the students' handbook are met.

Programme-specific assessment regulations

The programme is compliant with the University's academic regulations (in particular, [UPR AS11](#), [UPR AS12/UPR AS13](#) and [UPR AS14](#)) with the exception of those listed below, which have been specifically approved by the University:

- None

Further points of clarification and interpretation relevant to this specific programme are given below:

- For the award of Postgraduate Certificate and Postgraduate Diploma in Molecular Biotechnology, the 60 or 120 credit points, respectively, must include either 7LMS0269 *Genetics and Protein Biology* (30 credit points) or 7LMS0273 *Applied Biotechnology* (30 credit points).
- To gain the 'Advanced Research' award, students must successfully complete the 240 taught credits. The award calculation for the MSc Cancer Immunotherapy with Advanced Research is based on the average of the best 150 credits; these will include the 75-credit point *Extended Research Project* module. Students who do not successfully complete the *Research Internship in Biosciences* module will

be offered the interim award MSc Molecular Biotechnology Studies, on successful completion of the *Research Methods* and the *Extended Research Project* modules.

- To gain the 'Sandwich' award, students must successfully complete the 240 taught credits, successfully complete a 30-week full-time equivalent placement and pass the *Work Placement Assessment* module. Students who do not successfully complete the placement and associated module assessments will be offered the interim award MSc Molecular Biotechnology Studies on successful completion of the *Research Methods* and *Research Project for Sandwich Route* modules.
- Students are responsible for securing their own placement. Students are usually required to secure their placement by the end of April in order to process the necessary paperwork to embark on the placement in sufficient time to complete the 30 weeks full-time equivalent of work required. Students who do not secure a placement within this timescale will be transferred from the 'Sandwich' award to the two-year 'with Advanced Research' award. In exceptional circumstances and only with agreement from the Programme Leader students may be able to transfer to the one-year route to complete their studies.
- Students are expected to attend all classes including lectures, workshops and practical and attendance will be monitored for each module.

E. Management of Programme & Support for student learning

Management

The programme is managed and administered through:

- Dean of School
- Associate Deans (Academic Quality Assurance and Education)
- A Programme Leader who is responsible for the day-to-day management of the programme and admissions tutor who is responsible for the admissions
- A designated Programme Administration team
- Module Co-ordinators who are responsible for individual modules
- A Programme Committee with the following membership: Programme Leader (Chair), a Programme Administrator, Module Co-ordinators, School Learning Information Services Consultant, lecturing staff who have a substantial input into the programme, and student representatives

Support

Students are supported by:

- An induction period at the beginning of the academic session
- An extensive Learning Resources Centre, incorporating a library and computer centre
- A Programme Leader to give advice on the programme regulations
- Personal tutors to provide pastoral and academic support
- Project tutors
- Module guide information and study guidance
- Online module information provided via the University's managed learning environment StudyNet and Canvas, a university-wide system for study support
- A student handbook
- Comprehensive feedback on assessed assignments
- Student representatives on the Programme Committee
- An English Language Teaching Centre
- The School of Life and Medical Sciences Academic Support Unit
- A substantial Student Centre that provides advice on issues such as finance, University regulations, legal matters etc.
- An Accommodation Office
- An Overseas Student Orientation course
- A Mathematics Drop-in Centre
- Disability Advisers
- An Equal Opportunities Officer
- The Students' Union
- Careers and Employment Service

F. Other sources of information

In addition to this Programme Specification, the University publishes guidance to registered students on the programme and its constituent modules:

- A dedicated programme site;
- A Definitive Module Document (DMD) for each constituent module;

The [Ask Herts](#) website provides information on a wide range of resources and services available at the University of Hertfordshire including academic support, accommodation, fees, funding, visas, wellbeing services and student societies.

As a condition of registration, all students of the University of Hertfordshire are required to comply with the University's rules, regulations and procedures. These are published in a series of documents called 'University Policies and Regulations' (UPRs). The University requires that all students consult these documents which are available on-line, on the UPR web site, at: <http://www.herts.ac.uk/secreg/upr/>. In particular, [UPR SA07](#) 'Regulations and Advice for Students' Particular Attention - Index' provides information on the UPRs that contain the academic regulations of particular relevance for undergraduate and taught postgraduate students.

In accordance with section 4(5) of the Higher Education and Research Act 2017 (HERA), the UK Office for Students (OfS) has registered the University of Hertfordshire in the register of English higher education providers. The Register can be viewed at: <https://www.officeforstudents.org.uk/advice-and-guidance/the-register/the-ofs-register/>.

G. Entry requirements

The normal entry requirements for the programme are:

MSc Biotechnology (one year full-time and two years part-time):

- a first or second class Honours Degree in Biomedical and related sciences with a background in molecular biology, genetics and immunology with a final classification grade of a minimum 60% with evidence of having completed a research project and practical experience in a range of laboratory techniques relevant to the course; OR
- a professional qualification accepted as equivalent to the above; OR
- a qualification in veterinary science, medicine or dentistry; OR
- a first or second class Honours Degree in disciplines other than those described above with a final classification grade of a minimum 60% but where the applicant, in the opinion of the Programme Leader, would benefit from, and succeed on, the programme
- In addition, all international students are required to demonstrate an English Language capability of IELTS 6.5 (with no less than 6.0 in any band) or equivalent qualification.

MSc Molecular Biotechnology (Sandwich) and MSc Molecular Biotechnology with Advanced Research (two years full-time):

- Average grade of 60% or above in an undergraduate degree in the Biological Sciences
- Students will be selected through interview

In addition, all international students on these pathways are required to demonstrate an English Language capability of IELTS 6.5 (with no less than 6.0 in any band) or equivalent qualification.

Applicants will be interviewed in order to establish their suitability based upon the following criteria:

The applicant will be rated on a 5-point scale for their ability to demonstrate:

- advanced knowledge in the field of Molecular Biology and Biotechnology and how this has been developed.

- ii. critical awareness of current issues in Molecular Biology and Biotechnology, in particular the impact of these on recent developments in the discipline.
- iii. practical experience in a range of laboratory techniques relevant to the biosciences.

If more students meet the above criteria than there are places available on the programme, students will be ranked and selected according to their interview performance and undergraduate degree grade average.

Non-Standard Entry

Applicants not within the categories described above, but who can demonstrate by other means, as specified below, that they can succeed on the programme will be considered on an individual basis.

- i. The equivalent of at least 5 years' experience of working full-time in the biotechnology or pharmaceutical industry.

For current entry tariff point requirements, please refer to the relevant page for the Course on the University website or on the online prospectus.

The programme is subject to the University's Principles, Policies and Regulations for the Admission of Students to Undergraduate and Taught Postgraduate Programmes (in [UPR SA03](#)), along with associated procedures. These will take account of University policy and guidelines for assessing accredited prior certificated learning (APCL) and accredited prior experiential learning (APEL).

If you would like this information in an alternative format please contact:
icaq@herts.ac.uk.

If you wish to receive a copy of the latest External Examiner's Report for the programme, please email a request to aqo@herts.ac.uk

MSc Molecular Biotechnology (one year full-time and two years part-time)

Table 2: Development of Intended Programme Learning Outcomes in the Constituent Modules

This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses.

		Programme Learning Outcomes (as identified in section 1 and the following page)														
		Knowledge & Understanding				Intellectual Skills		Practical Skills		Transferable Skills						
Module Title	Module Code	A1	A2	A3	A4	B1	B2	C1	D1	D2	D3	D4	D5	D6	D7	
Molecular Cell Biology and Immunology	7LMS0279	X	X			X	X	X				X	X	X		
Genetics and Protein Biology	7LMS0269	X	X			X	X	X				X	X		X	
Genome Science	7LMS0276		X	X		X	X	X	X	X	X	X	X	X	X	
Applied Biotechnology	7LMS0273		X		X	X	X	X	X	X	X	X	X	X	X	
Research Project with Research Methods	7LMS0278		X	X	X	X	X	X	X	X		X	X	X	X	

MSc Molecular Biotechnology (Sandwich)

Table 2a: Development of Intended Programme Learning Outcomes in the Constituent Modules

This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses.

		Programme Learning Outcomes (as identified in section 1 and the following page)														
		Knowledge & Understanding				Intellectual Skills			Practical Skill	Transferable Skills						
Module Title	Module Code	A1	A2	A3	A4	B1	B2	B4	C1	D1	D2	D3	D4	D5	D6	D7
Molecular Cell Biology and Immunology	7LMS0279	X	X			X	X		X				X	X	X	
Genetics and Protein Biology	7LMS0269	X	X			X	X		X				X	X		X
Genome Science	7LMS0276		X	X		X	X		X	X	X	X	X	X	X	X
Applied Biotechnology	7LMS0273		X		X	X	X		X	X	X	X	X	X	X	X
Research Project for Sandwich Route	7LMS2113		X		X	X	X		X	X	X		X	X	X	X
MSc Biosciences Placement Year	7LMS2114							X							X	X
Work Placement Assessment	7LMS2003							X	X				X	X	X	X
Research Methods	7LMS2112				X		X		X				X	X	X	

MSc Molecular Biotechnology with Advanced Research

Table 2b: Development of Intended Programme Learning Outcomes in the Constituent Modules

This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses.

		Programme Learning Outcomes (as identified in section 1 and the following page)															
		Knowledge & Understanding				Intellectual Skills			Practical Skills		Transferable Skills						
Module Title	Module Code	A1	A2	A3	A4	B1	B2	B3	C1	D1	D2	D3	D4	D5	D6	D7	
Molecular Cell Biology and Immunology	7LMS0279	X	X			X	X		X				X	X	X		
Genetics and Protein Biology	7LMS0269	X	X			X	X		X				X	X		X	
Genome Science	7LMS0276		X	X		X	X		X	X	X	X	X	X	X	X	
Applied Biotechnology	7LMS0273		X		X	X	X		X	X	X	X	X	X	X	X	
Extended Research Project	7LMS2005		X	X	X	X	X	X	X	X	X		X	X	X	X	
Research Internship in Bioscience	7LMS2004						X	X	X	X	X		X	X	X	X	
Research Methods	7LMS2112				X		X		X				X	X	X		

KEY TO PROGRAMME LEARNING OUTCOMES

Knowledge and Understanding

- A1. Develop advanced knowledge and understanding to relate gene expression to the phenotype of an organism via an understanding of gene and protein structure and function, developmental biology and the influence of the environment on gene expression.
- A2. Develop advanced knowledge and understanding to critically evaluate the methodologies of gene mapping, recombinant DNA technology and introductory bioinformatics and apply them to the investigation and deconstruction of biological systems.
- A3. Develop advanced knowledge and understanding to evaluate translational effects of resistance to antimicrobial agents and understand the molecular mechanisms that underpin them in bacteria, viruses, and fungi.

Practical Skills

- C1. Design, execute, interpret and report investigations (practical and theoretical) of molecular biology problems and molecular genetics of disease, critically evaluate the contribution made to current knowledge and propose avenues for future study.

- A4. Develop advanced knowledge and understanding to critically evaluate the molecular mechanisms that underpin antimicrobial resistance in microorganisms and evaluate mechanisms to circumvent them.

Intellectual Skills

- B1. Evaluate the applications of microbiological methods in fundamental research, clinical microbiology, and industry.
- B2. Demonstrate a critical approach in enquiry and hypothesis testing and critically evaluate scientific literature and experimental data.
- B3. Integrate research skills, analytical and critical skills in an extended project.
- B4. Integrate theoretical and practical skills in a professional working environment.

Transferable Skills

- D1. Effectively communicate analyses of case studies in both the written and spoken word and defend the findings of their work.
- D2. Demonstrate self-direction and originality in tackling and solving problems and act autonomously in planning and executing tasks.
- D3. Contribute effectively to the functioning of a group and reflect on the learning experience.
- D4. Demonstrate numeracy and manipulate, analyse and present data.
- D5. Apply appropriate information technology to the recovery, analysis and reporting of biological data.
- D6. Continue to learn independently and to develop professionally.
- D7. Communicate effectively, with colleagues and a wider audience.

Table 3: Development of Graduate Attributes in the Constituent Modules

This map identifies where the Graduate Attributes are delivered in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the development of the Graduate Attributes (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own personal and professional development as the programme progresses. [Note that there is no requirement for the Graduate Attributes to be assessed through these modules]

D = Delivered

Module Title	Module Code	Professionally Focused	Globally Minded	Sustainability Driven	Digitally capable & confident	Inclusive and collaborative	Evidenced based and Ethical
Molecular Cell Biology and Immunology	7LMS0279		D	D	D		
Genetics and Protein Biology	7LMS0269		D	D	D	D	
Genome Science	7LMS0276		D	D	D	D	
Contemporary Topics in Medical Microbiology	7LMS0272		D	D	D	D	
Research Project with Research Methods	7LMS0278	D	D	D	D	D	D
MSc Biosciences Placement Year	7LMS2114	D	D	D	D	D	
Work Placement Assessment	7LMS2003	D	D		D		
Research Internship in Bioscience	7LMS2004	D	D		D	D	D
Extended Research Project	7LMS2005	D	D	D	D	D	D
Research Project for Sandwich Route	7LMS2113	D	D	D	D	D	D
Research Methods	7LMS2112		D		D		D

Section 2

Programme management

Relevant QAA subject benchmarking statements	None
Type of programme	Taught postgraduate
Date of validation/last periodic review	February 20
Date of production/ last revision of PS	Sept 2023
Relevant to level/cohort	Level 7 entering September 2024
Administrative School	School of Life and Medical Sciences
Language of Delivery	English

Table 4 Course structure

Course details			
Course Code	Course Description	HECOS	UCAS
LMMBM	MSc Molecular Biotechnology (Revised 2024)	100907	N/A
LMMBME	MSc Molecular Biotechnology – Extended (Revised 2024)		