

Faculty: Health and Human Sciences

Title of Programme: **MSc Molecular Biology**

Programme Code: HHMBIO

Programme Specification

Start Date: 09/2006

Date of Approval: amended 16 June 2008

Associate Dean (Academic Quality): Jan Turner

Signature: Jan Turner

Programme Specification MSc Molecular Biology

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	MSc
All Final Award titles	Molecular Biology
FHEQ level of award	Masters (M)

A. Programme Rationale

The programme is designed to provide a postgraduate education in molecular biology for graduates in the Biosciences or Biological Chemistry and is particularly suited to overseas students. The Programme has been designed to enable two entry cohorts – September (Semester A) and February (Semester B). A strong practical foundation is provided at the onset of the course for both cohorts from which the semester A cohort progresses to problem-based learning and the semester B cohort progresses to the project.

The use of PBL approaches is a key feature of the programme and should encourage development of investigative skills, the ability to work in a group and the development of confidence in the investigating new areas.

B. Educational Aims of the Programme

The programme has been devised in accordance with the University's general educational aims of programmes of study as set out in UPR AS/C/3.

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 apply 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 of knowledge 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.

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 to the Framework for Higher Education Qualifications in England, Wales and Northern Ireland (2001), and relate to the typical student. Additionally, the SEEC Credit Level Descriptors for Further and Higher Education 2003 have been used as a guiding framework for curriculum design.

Knowledge and Understanding of:	Teaching/learning methods & strategies	Assessment
<p>A1 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</p>	<p>Acquisition of knowledge and understanding is through:</p> <p>Acquisition of A1 and A2 is through a combination of lectures, laboratory classes, tutorials and guided reading in Core Molecular Biology and Genes Proteins and Development. These outcomes will also be reinforced and developed in the problem-based learning (PBL) exercises in semester B.</p>	<p>Knowledge and understanding are assessed through a combination of unseen tests (A1, 2, 3, 4,) data interpretation exercises (A3, 4) oral presentations (A1, 2), laboratory records (A1, 2), <i>viva voce</i> examinations (A3, 4), PBL assignments (A3, 4), bioinformatics exercise (A2), synoptic summary (A2) and the design, execution and reporting of a research project (A2)</p>
<p>A2 critically 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 is achieved through the lecture programme, and problem-based learning (PBL) exercises in Molecular Biotechnology.</p>	
<p>A3 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 is achieved through the lecture programme, and problem-based learning (PBL) exercises in Molecular Medicine.</p>	
<p>A4 Evaluate the molecular mechanisms that underpin selected inherited, non-inherited and infectious human diseases and understand the molecular strategies in developing therapeutics.</p>	<p>Throughout, the learner is encouraged to undertake independent study both to supplement and consolidate what is being taught/learnt and to broaden their individual knowledge and understanding of the subject.</p>	

Intellectual skills - able to:	Teaching/learning methods & strategies	Assessment
<p>Successful students will typically be able to:</p> <p>B1 evaluate the applications of molecular methods in fundamental research and industry.</p> <p>B2 critically evaluate scientific literature and experimental data.</p>	<p>.Acquisition of B1 is through the laboratory classes, the project and PBL exercises.</p> <p>Acquisition of B2 is through the project, PBL exercises and the synoptic summary in Genes, Proteins and Development.</p> <p>Throughout, the learner is encouraged to develop intellectual skills further by independent study</p>	<p>Intellectual skills are assessed through using laboratory reports (B1, 2), <i>viva voce</i> examinations (B1, 2), the Project (B1, 2) and PBL assignments (B1, 2).</p>
Practical skills - able to:	Teaching/learning methods & strategies	Assessment
<p>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.</p>	<p>Acquisition of C1 is through laboratory classes, the Project and PBL classes</p>	<p>Practical skills are assessed through laboratory reports <i>viva voce</i> examinations the Project and PBL assignments.</p>
Transferable skills - able to:	Teaching/learning methods & strategies	Assessment
<p>Successful students will typically be able to:</p> <p>D1 effectively communicate analyses of case studies in both the written and spoken word and defend the findings of their work.</p> <p>D2 demonstrate self-direction and originality in tackling and solving problems and act autonomously in planning and executing tasks.</p> <p>D3 contribute effectively to the functioning of a group and reflect on the learning experience.</p> <p>D4 apply appropriate information technology to the recovery, analysis and reporting of data</p>	<p>Transferable skills are developed throughout the programme:</p> <p>Acquisition of D1 is achieved in the PBL modules and the project.</p> <p>Acquisition of D2 is through the Project, PBL and the supporting mentoring programme operated in Semester A.</p> <p>Acquisition of D3, is achieved through the PBL modules</p> <p>Acquisition of D4 is achieved in the PBL exercises, the bioinformatics assignment in Core Molecular Biology and the project</p> <p>Throughout, the learner is encouraged to develop transferable skills by maintaining a record of evidence and completing a personal development plan.</p>	<p>Transferable skills are assessed through laboratory reports (D1,4); <i>viva voce</i> examinations (D1 and D2); seminars (D1) PBL reports (D1,3,4) and the Project (D1,2,4)</p>

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

The programme is offered in full-time mode (Semester A intake 3 semesters (ABC); Semester B intake 4 semesters (BCAB including summer vacation)) and leads to the award of an MSc in Molecular Biology. Entry is normally at level M (with suitable qualifications as specified in Section F) but is possible at a preliminary year at level 2/3 with suitable qualifications (for example, a degree in a non-biological subject)

The programme code is HHMBIO and the pathway point codes are MMOL1 and MMOLB1

The programme structure and progression information below is provided for the MSc award (Table 1). The Programme Learning Outcomes detailed in Section C are developed and assessed through the constituent modules. Table 2 identifies where each learning outcome is assessed.

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 (in section 2) identifies where each learning outcome is assessed.

The module 'Level M project preparation' is taken by the Semester B entry cohort only and is designed to support students in preparing for the project. The module is zero credit points rated and includes the development of practical skills, the assessment of which is incorporated into MLFS0024 and MLFS0025.

Table 1a Outline Programme Structure

Compulsory Modules Module Title	Module Code	Credit Points	% examination	% coursework	Semester
Core Molecular Biology	MLFS0024	30	0	100	A
Genes , Proteins and Development	MLFS0025	30	0	100	A
Molecular Biotechnology	MLFS0029	30	0	100	B
Molecular Medicine	MLFS0027	30	0	100	B
Project – Mol Biol, Biotech, Pharmacology and Bioinformatics	MLFS0031	60	0	100	BC, C
Level M project preparation*	MLFS0056	0	0	0	B

*Taken by Semester B entry cohort only.

The award of an MSc requires 180 credit points passed at level M.

Table 1b Interim awards available

The programme provides the following interim awards:

Award	Minimum requirements	Available at end of (normally):
Postgraduate Certificate	60 credit points, at level M	1-2 Semesters
Postgraduate Diploma	120 credit points at level M	2, 3 or 4 Semesters
Masters	180 credit points at level M	3 or 4 Semesters

Masters and Diploma awards can be made "with Distinction" or "with Commendation" where criteria as described in UPR AS/C/5 and the students' handbook are met.

E. Support for students and their learning

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 Tutor to give academic advice
- Personal tutors to provide pastoral and academic support

- A mentor to support the acquisition of study skills and report writing
- Project tutors
- Module guides providing module information and study guidance
- On-line module information provided via the University's managed learning environment "Studynet", 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
- A substantial Student Centre that provides advice on issues such as finance, University regulations, legal matters etc
- An Accommodation Office
- A Students Centre
- An Overseas Student Orientation course
- A Mathematics Drop-in Centre
- A Disabled Student Co-ordinator
- An Equal Opportunities Officer
- The Students' Union

F. Entry requirements

The normal entry requirements for the programme are:

- a first or second class Honours Degree in Biosciences or Biological Chemistry;
- a professional qualification accepted as equivalent to the above;
- a first or second class Honours Degree in disciplines other than those described above but where the applicant, in the opinion of the programme Tutor, would benefit from, and succeed on, the programme;
- proficiency in English as demonstrated by an approved test.

The following applicants will also be considered for entry into the programme, but may be initially registered for the PgCert or PgDip:

- holder of degrees with third class honours or without Honours who, in the opinion of the Programme Tutor, would benefit from a programme of postgraduate study;
- holders of an HNC or HND or equivalent qualification plus several years professional experience in the Biosciences or Chemical Sciences; such applicants would normally be expected to be at least 25 years of age and may be required to attend a preliminary qualifying module.

Applicants not within the categories described above, but who can demonstrate by other qualifications, research publications or appropriate experience that they can benefit from the course will be considered on individual merit.

At the discretion of the Programme tutor or nominee an applicant may be required to attend a preliminary module or modules taken from the University's undergraduate programme. Such students will register initially under the Credit Accumulation and Transfer Scheme (CATS) and transfer registration to the MSc Molecular Biology Programme following successful completion of the preliminary module(s).

Overseas students who are deficient in English may apply for entry via the International Bridging course.

The programme is subject to the University's Principles, Policies, Regulations and Procedures for the Admission of Students to Undergraduate and Taught Postgraduate Programmes and will take account of University policy and guidelines for assessing accredited prior learning (APL) and accredited prior experiential learning (APEL).

Section 2

Programme management

JACS code(s)	J700
Modes of study	F/T
Intakes	Semesters A and B
Relevant QAA subject benchmarking group	None
Date of validation/last periodic review	January 2006
Date of production/ last revision of PS	08 May 2007
Relevant cohorts	Students entering September 2008
Faculty	Health and Human Sciences
Administrative School(s)/Departments	Life Sciences

Course (i.e. pathway) details

Course (ie. Pathway Point) Titles	Course (ie. Pathway Point) Codes
MSc Molecular Biology	MMOL1, MMOLB1

The programme is managed by;

- Associate Head of Department who has overall responsibility for programmes in Life Sciences
- A Programme Tutor who is responsible for the day to day management and admissions
- Faculty Postgraduate Administrator to deal with day to day administration associated with the programme
- Module Co-ordinators who are responsible for individual modules
- a Programme Committee with the following membership: Programme Tutor (chair), a Faculty Administrator (Secretary), Associate Head of Department (Life Sciences), Module Co-ordinators, Faculty Learning and Information Services consultant, lecturing staff who have a substantial input into the programme, and student representatives.

Programme-specific assessment regulations

The programme is compliant with the University's generic assessment regulations (Structure and Assessment Regulations for Academic Programmes, UPR AS/C/5) 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:

- In order to pass any constituent module of the programme, attendance of at least 85% of the classes specified in the module is normally required. Failure to attend the required proportion of classes will normally result in the award of an F2 grade.

Other sources of information

- Definitive Module Documents
- Module Guides
- Student Handbook
- Programme Specification website:
<http://perseus.herts.ac.uk/uhinfo/administration/aqo/programmes/programmes.cfm>
- University of Hertfordshire Prospectus website:
http://perseus.herts.ac.uk/prospectus/prospectus_home.cfm
- The Framework for Higher Education Qualifications in England, Wales and Northern Ireland, 2001:
<http://www.qaa.ac.uk/academicinfrastructure/FHEQ/EWNI/default.asp>
- SEEC Credit Level Descriptors for Further and Higher Education 2003: <http://www.seec-office.org.uk/creditlevel descriptors2003.pdf>
- External Quality Review report website:
http://www.qaa.ac.uk/revreps/inst_reports.asp?instID=H-0060
- Teaching Quality Information (TQI) website:

- <http://www1.tqi.ac.uk/sites/tqi/home/index.cfm>
- University of Hertfordshire Academic Quality Office website:
<http://perseus.herts.ac.uk/uhinfo/administration/aqo/general/aqo.cfm>
- Structure & Assessment Regulations - Undergraduate & Taught Postgraduate Programmes, UPR AS/C/5:
<http://www.herts.ac.uk/secreg/upr/AS-C-5.htm>
- Learning and Teaching Policy and General Educational Aims, UPR AS/C/3:
<http://www.herts.ac.uk/secreg/upr/AS-C-3.htm>
- Admissions - Undergraduate & Taught Postgraduate Students, UPR AS/C/4:
<http://www.herts.ac.uk/secreg/upr/AS-C-4.htm>
- Academic Quality, UPR AS/C/1:
<http://www.herts.ac.uk/secreg/upr/AS-C-1.htm>
- Index of UPRs for students:
http://www.herts.ac.uk/secreg/upr/upr_azlist_student_info.htm

Other information relevant to the programme

Core Molecular Biology, Molecular Medicine and the Project also contribute to the MSc in Pharmacology. Core Molecular Biology and the Project also contribute to the MSc in Bioinformatics. Core Molecular Biology, Genes Proteins and Development, Molecular Biotechnology and the Project also contribute to the MSc in Bioinformatics.

University policies relevant to the Programme

The University undertakes to use all reasonable endeavours to deliver, assess and administer this programme in accordance with this Programme Specification. At the same time it is recognised that it is in the nature of academic developments that changes, for example to the structure, curriculum, and assessment of a programme may be necessary in order to ensure that the programme remains up to date, in response to issues raised as a result of on-going monitoring and evaluation, and/or in order to conform to new regulatory requirements imposed by this institution, by professional or statutory bodies, or by national or governmental bodies.

The programme operates within the guidelines and policies relating to equal opportunities and environmental issues which may be agreed from time to time by the Board of Governors and/or the Academic Board of the University.

Where the programme is offered in collaboration with another institution these policies and guidelines will normally be those of the partner institution.

The programme operates in accordance with the University's Regulations Governing Studies Involving the Use of Human Subjects (UPR AS/A/2) agreed from time to time by the Academic Board of the University. However, where the programme is offered in collaboration with another institution (for example through a franchise arrangement for all or part of the programme) then specific approval must be obtained from the University for the operation of the programme within ethical guidelines prepared by the partner institution. The partner institution will be responsible for all insurance liability in connection with the observance of ethical guidelines.



Signed
Chair of Faculty Academic Quality Enhancement Committee

Date..... 16.06.08.....

If you would like this information in an alternative format please contact:
Mike Fossey

MSc Molecular Biology

Table 2: Development of 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	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C5	C6	C7	C8	D1	D2	D3	D4	D5	D6	D7	
Core Molecular Biology	MLFS0024	x	x															x															x
Genes, Proteins and Development	MLFS0025	x	x															x															
Level M Molecular Biotechnology	MLFS0029		x	x						x	x														x		x	x					
Level M Molecular Medicine	MLFS0027		x		x					x	x														x		x	x					
Level M Project – Mol Biol, Biotech, Pharmacology and Bioinformatics	MLFS0031																																
Level M project preparation	MLFS0056		x							x	x														x	x		x					

Key: Learning Outcome which is assessed as part of the module ☒

Key to Programme Learning Outcomes

Knowledge and Understanding eg

A1 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 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 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.

A4 Evaluate the molecular mechanisms that underpin selected inherited, non-inherited and infectious human diseases and understand the molecular strategies in developing therapeutics.

Intellectual Skills eg

B1 evaluate the applications of molecular methods in fundamental research and industry.

B2 critically evaluate scientific literature and experimental data.

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.

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 apply appropriate information technology to the recovery, analysis and reporting of data