School of Life and Medical Sciences

Title of Programme: **MSc Pharmacology**

Programme Code:  HHPHA

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**Programme Specification**

This programme specification is relevant to students entering:
17 September 2018

Associate Dean of School (Academic Quality Assurance):
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**

<table>
<thead>
<tr>
<th>Date</th>
<th>Section</th>
<th>Amendment</th>
</tr>
</thead>
</table>

If you have any queries regarding the changes please email  **AQO@herts.ac.uk**
Programme Specification  MSc Pharmacology

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

A. Programme Rationale

The programme is designed to provide a postgraduate education in Pharmacology 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 pharmacology investigations, and on aspects of molecular biology and bioinformatics. In the second semester there is a progression to problem-based learning (PBL) to develop an in-depth understanding of drug discovery and development and molecular medicine. Students will also learn how to apply pharmacological and physiological principles to the interpretation of case studies in drug discovery. During the final semester, the research project may include aspects of gastrointestinal pharmacology, particularly with respect to diabetes, angiogenesis, cancer, molecular pharmacology of vascular disease, drug metabolism.

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.

B. Educational Aims of the Programme

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 apply advances in pharmacology and related areas of 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 pharmacology;
• provide a framework for the acquisition of a comprehensive understanding of molecular biology and pharmacology 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 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 (2016) have been used as a guiding framework for curriculum design.

<table>
<thead>
<tr>
<th>Knowledge and Understanding:</th>
<th>Teaching/learning methods &amp; strategies</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 the relationship of gene expression to the phenotype of an organism via an understanding of gene and protein structure and function.</td>
<td>Acquisition of knowledge and understanding is through:</td>
<td>Knowledge and understanding are assessed through a combination of unseen tests (A1-A5) data interpretation exercises (A2, A3 ) oral presentations (A4, A5), laboratory records (A2, A5), viva voce examinations (A2, A3), PBL assignments (A2, A3), bioinformatics exercise (A2).</td>
</tr>
<tr>
<td>A2 the methodologies of recombinant DNA technology and introductory bioinformatics and apply them to the investigation and deconstruction of biological systems and therapeutic targets.</td>
<td>A1 is achieved through a combination of lectures, laboratory classes, tutorials and guided reading in <em>Core Molecular Biology</em>. A2 is achieved via a similar teaching programme in <em>Core Molecular Biology</em> and <em>Core Pharmacology</em>.</td>
<td></td>
</tr>
<tr>
<td>A3 advances in knowledge, at a systems and molecular level, of the pathological basis of disease and their modulation by therapeutic strategies.</td>
<td>A3 is achieved through a combination of lectures and problem-based learning (PBL) exercises in <em>Molecular Medicine and Drug Discovery, Development and Pharmacovigilance</em>.</td>
<td></td>
</tr>
<tr>
<td>A4 molecular concepts of drug action to the drug discovery process.</td>
<td>A4 is achieved through the lecture programme, and problem-based learning (PBL) exercises in <em>Molecular Medicine</em>.</td>
<td></td>
</tr>
<tr>
<td>A5 the extent and duration of drug action in terms of concepts of pharmacokinetics and pharmacodynamics.</td>
<td>A5 is achieved through the lecture and practical programme in <em>Core Pharmacology</em> and lectures, workshops and PBL exercises in <em>Drug Discovery, Development and Pharmacovigilance</em>.</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Intellectual skills:</th>
<th>Teaching/learning methods &amp; strategies</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1 evaluate the applications of molecular and pharmacological methods in fundamental research and the pharmaceutical industry.</td>
<td>Intellectual skills are developed through: Acquisition of B1 is through the laboratory classes, the Project, Research Methods and PBL exercises. Acquisition of B2 is through Research Methods, the project, PBL exercises and in Core Pharmacology. Throughout, the learner is encouraged to develop intellectual skills further by independent study.</td>
<td>Intellectual skills are assessed through using laboratory reports, <em>viva voce</em> examinations, the project and PBL assignments.</td>
</tr>
<tr>
<td>B2 critically evaluate scientific and clinical literature and experimental data.</td>
<td>Practical skills are developed through laboratory classes, the PBL exercises, Research Methods and Project.</td>
<td>Practical skills are assessed through laboratory reports <em>viva voce</em> examinations the PBL assignments, the project proposal and project.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Practical skills:</th>
<th>Teaching/learning methods &amp; strategies</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 design, execute, interpret and report investigations (practical and theoretical) of pharmacology and molecular biology problems and critically evaluate the contribution made to current knowledge and propose avenues for future study.</td>
<td>Transferable skills are developed throughout the programme: Acquisition of D1 is achieved in the PBL modules and the Project. Acquisition of D2 is through the Project, PBL and the supporting mentoring programme operated in Semester A. Acquisition of D3 is achieved through the PBL modules Acquisition of D4 and D5 is achieved in the PBL exercises, bioinformatics practicals in Core Molecular Biology and the project. Throughout, the learner is encouraged to develop transferable skills by maintaining a record of evidence and completing a personal development plan.</td>
<td>Transferable skills are assessed through laboratory reports (D1,4); <em>viva voce</em> examinations (D1 and D2); seminars (D1) PBL reports (D1, D3, D4, D5) and the project (D1, D2, D4, D5).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transferable skills:</th>
<th>Teaching/learning methods &amp; strategies</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>Transferable skills are developed throughout the programme: Acquisition of D1 is achieved in the PBL modules and the Project. Acquisition of D2 is through the Project, PBL and the supporting mentoring programme operated in Semester A. Acquisition of D3 is achieved through the PBL modules Acquisition of D4 and D5 is achieved in the PBL exercises, bioinformatics practicals in Core Molecular Biology and the project.</td>
<td>Transferable skills are assessed through laboratory reports (D1,4); <em>viva voce</em> examinations (D1 and D2); seminars (D1) PBL reports (D1, D3, D4, D5) and the project (D1, D2, D4, D5).</td>
</tr>
</tbody>
</table>
D. Programme Structures, Features, Levels, Modules, and Credits

The programme is offered in full-time mode (Semester A intake over 3 semesters (ABC) and leads to the award of an MSc in Pharmacology. Entry is normally at level 7 with a good Honours degree as specified in Section F.

Professional and Statutory Regulatory Bodies
None

Work-Based Learning, including Sandwich Programmes
Not Applicable

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

<table>
<thead>
<tr>
<th>Compulsory Modules</th>
<th>Module Code</th>
<th>Credit Points</th>
<th>Language of Delivery</th>
<th>% Examination</th>
<th>% Coursework</th>
<th>% Practical</th>
<th>Semesters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellular Molecular Biology</td>
<td>7LMS0089</td>
<td>30</td>
<td>English</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>A</td>
</tr>
<tr>
<td>Core Pharmacology</td>
<td>7LMS0090</td>
<td>30</td>
<td>English</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>A</td>
</tr>
<tr>
<td>Drug Discovery, Development and Pharmacovigilance</td>
<td>7LMS0094</td>
<td>30</td>
<td>English</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>B</td>
</tr>
<tr>
<td>Molecular Medicine</td>
<td>7LMS0092</td>
<td>30</td>
<td>English</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>B</td>
</tr>
<tr>
<td>Project – Mol Biology, Biotechnology, Pharmacology</td>
<td>7LMS0096</td>
<td>45</td>
<td>English</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>C</td>
</tr>
<tr>
<td>Biosciences Research Methods for Masters</td>
<td>7LMS0095</td>
<td>15</td>
<td>English</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>ABC</td>
</tr>
</tbody>
</table>

The award of an MSc requires 180 credit points passed at level 7. Although the modules are assessed by coursework, this will also include some in-course tests.
Table 1b. Final and interim awards available
The programme provides the following final and interim awards:

<table>
<thead>
<tr>
<th>Final Award</th>
<th>Award Title</th>
<th>Minimum requirements</th>
<th>Available at end of Level</th>
<th>Programme Learning Outcomes developed (see above)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masters</td>
<td>Pharmacology</td>
<td>180 credit points including at least 150 at level 7</td>
<td>3 Semesters</td>
<td>All programme learning outcomes (see above)</td>
</tr>
<tr>
<td>Interim</td>
<td>Award Title</td>
<td>Minimum requirements</td>
<td>Available at end of Level</td>
<td>Programme Learning Outcomes developed (see above)</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>Diploma</td>
<td>Pharmacology</td>
<td></td>
<td>A1, A2, A3, A4, B1, B2, C1, D1, D2, D3, D4, D5</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>Certificate</td>
<td>60 credit points, including at least 45 at level 7</td>
<td>1-2 Semesters</td>
<td></td>
</tr>
</tbody>
</table>

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 (delete as applicable) 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 Pharmacology the 60 or 120 credit points must include either 7LMS0090 Core Pharmacology (30 credit points) or 7LMS0094 Drug Discovery, Development and Pharmacovigilance (30 credit points)
- 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 FREN grade.

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 Learning and Teaching)
• A Programme Leader who is responsible for the day to day management of the programme and admissions
• A designated Programme 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 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 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
• An Overseas Student Orientation course
• A Mathematics Drop-in Centre
• A Disabled Student Co-ordinator
• An Equal Opportunities Officer
• The Students’ Union
• Careers, Enterprise 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 Programme (or Student) Handbook;
• A Definitive Module Document (DMD) for each constituent module;
• A Module Guide for each constituent module.
• University of Hertfordshire Course website: http://www.herts.ac.uk/courses/
• Information on Programme and Module External Examiners http://www.studynet1.herts.ac.uk/ptl/common/studentcentre.nsf/Teaching+Documents/184A221E6EECA6B780257A5C00250BA9?OpenDocument

The Herts Handbook is an introduction to the academic, social, cultural and sporting services and opportunities available at the University of Hertfordshire, and includes the Student Charter and Student Code of Conduct.

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.

The UK Quality Assurance Agency for Higher Education (QAA) has confirmed the quality and standards of provision at the University of Hertfordshire. A key part of QAA’s role is to review and report on how universities maintain their academic standards and quality, to inform students and the wider public. The team of QAA reviewers visited the University of Hertfordshire in 2015/16 and judged that its academic standards, the quality and enhancement of its students’ learning experience, and the quality of information about this learning experience all meet UK expectations. In other words, the University meets national requirements for standards and quality. The QAA’s report can be accessed at: http://www.qaa.ac.uk/reviews-and-reports/provider?UKPRN=10007147#.V-KHajXy0nE

Other information relevant to the programme

Core Molecular Biology, Molecular Medicine and the Project also contribute to the MSc in Molecular Biology. Core Molecular Biology and the Project also contribute to the MSc in Biotechnology.

Transitional Arrangements: Arrangements will be made for those students required to retake any module by enrolment on a mapped equivalent module. Any further requirements to meet the learning outcomes will be made by providing additional lecture/workshop material and guidance for directed independent study.

G. Entry requirements

The normal entry requirements for the programme are:

i. a first or second class Honours Degree in Biosciences or Biological Chemistry with a final classification grade of a minimum 65%; or

ii. a professional qualification accepted as equivalent to the above; or

iii. a qualification in veterinary science, medicine or dentistry or

iv. a first or second class Honours Degree in disciplines other than those described above but where the applicant, in the opinion of the Programme Leader, would benefit from, and succeed on, the programme; or

v. successful completion of the International Pre-Masters (IPM) programme at the University or at Hertfordshire International College (HIC).

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.

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. at least 5 years experience working full-time in the biotechnology or pharmaceutical industry.

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

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

1. an advanced knowledge in the field of pharmacology and how this has been developed during employment.
2. critical awareness of current issues in pharmacology, in particular the impact of molecular biology on recent developments in the discipline.
3. practical experience in a range of laboratory techniques relevant to the biosciences.

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: Maria Goodin, Student Administrator

If you wish to receive a copy of the latest Programme Annual Monitoring and Evaluation Report (AMER) and/or the External Examiner’s Report for the programme, please email a request to aqo@herts.ac.uk
## MSc Pharmacology

### 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.

<table>
<thead>
<tr>
<th>Module Title</th>
<th>Module Code</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
<th>A5</th>
<th>B1</th>
<th>B2</th>
<th>C1</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
</tr>
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<tr>
<td>Cellular Molecular Biology</td>
<td>7LMS0089</td>
<td>x</td>
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</tr>
<tr>
<td>Core Pharmacology</td>
<td>7LMS0090</td>
<td>x</td>
<td>x</td>
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<td>x</td>
<td>x</td>
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</tr>
<tr>
<td>Drug Discovery, Development and Pharmacovigilance</td>
<td>7LMS0094</td>
<td>x</td>
<td>x</td>
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<td>x</td>
<td>x</td>
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<td>x</td>
</tr>
<tr>
<td>Molecular Medicine</td>
<td>7LMS0092</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
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<td>Biosciences Research methods for Masters</td>
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<td>x</td>
<td>x</td>
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<td>x</td>
<td>x</td>
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<td></td>
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<td>x</td>
</tr>
</tbody>
</table>
KEY TO PROGRAMME LEARNING OUTCOMES

Knowledge and Understanding

A1. A1 relate gene expression to the phenotype of an organism via an understanding of gene and protein structure and function.

A2. critically evaluate the methodologies of recombinant DNA technology and introductory bioinformatics and apply them to the investigation and deconstruction of biological systems and therapeutic targets.

A3. interpret current advances in knowledge, at a systems and molecular level, of the pathological basis of disease and their modulation by therapeutic strategies.

A4. apply molecular concepts of drug action to the drug discovery process.

A5. interpret the extent and duration of drug action in terms of concepts of pharmacokinetics and pharmacodynamics.

Practical Skills

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

Intellectual Skills

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

B2. critically evaluate scientific and clinical literature and experimental data.

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.
Section 2

Programme management

Relevant QAA subject benchmarking statements
None

Type of programme
Taught postgraduate

Date of validation/last periodic review
February 14

Date of production/last revision of PS
June 2017

Relevant to level/cohort
Level 7 entering September 2018

Administrative School
School of Life and Medical Sciences

Table 3 Course structure

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course description</th>
<th>JACS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HHPHA</td>
<td>MSc Pharmacology</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B210</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Instances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instances code</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>MPHA1F-1</td>
</tr>
<tr>
<td>MPHA1F-2</td>
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