Programme Specification

MPharm Pharmacy UCAS code: B230

For students entering Part 1 in October 2005

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading Faculties of Science and Life Sciences
Relevant QAA subject benchmarking group(s):	Pharmacy
Programme length:	4 years
Date of specification:	July 2008
Programme Director:	Dr G J Stephens
Programme Adviser:	Prof E M Williamson
Board of Studies:	Pharmacy
Accreditation:	Royal Pharmaceutical Society of Great Britain (RPSGB)

Summary of programme aims and learning outcomes

The programme aims to provide a modern, innovative and integrated Masters degree-level education in Pharmacy that meets the standards of the University and the requirements of the RPSGB. The MPharm will teach students to be responsible for the manufacture, safe, legal and professional control, distribution and use of medicinal products and will encompass detailed studies of all aspects of drug action, design, formulation and use. Thus students will be trained in aspects of chemistry, biology, statistics, social and clinical pharmacy, and law, that impact on pharmacy.

Transferable skills

The University's Strategy for Teaching and Learning has identified a number of generic transferable skills which all students are expected to have developed by the end of their degree programme. In following this programme, students will have had the opportunity to develop their skills relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team-working and use of information technology.

As part of this programme, students are also expected to have gained experience and show competence in the following skills: Problem based learning, IT (pharmacy related as well as word-processing, use of spreadsheets and databases), communication, scientific writing, oral presentation, team-working, use of library resources, time-management, research methods and skills, self-motivation skills, and career planning and management.

Programme content

The MPharm Pharmacy degree programme is divided into four Parts, each of 120 credits. The degree profile outlined below lists the compulsory modules and gives some indication of the optional modules from which the student must make a selection. Students choose such optional modules in consultation with the Programme Adviser or the Programme Director. The number of credits for each module is given after its title.

Part 1 (three terms)	*Credits*	*Level*

Compulsory Modules

PM1PP1	*Pharmacy Practice 1 (inc placements)*	20	C
PM1PB2	*Human Physiology*	20	C
PM1DS1	*Drug Design & Synthesis: Basic Organic Chemistry*	20	C
PM1MP1	*Formulation & Stability of Medicines*	10	C
BI1C11	*Genetics and Molecular Biology*	10	C
AM1P14	*Biochemistry and Metabolism*	10	C
AM1P11	*Introduction to Microbial Pathology*	10	C
CH1M1	*Maths for Pharmacy*	10	C
CH1P2	*Physical Biochemistry*	10	C
PM1ESA	*Concepts and Skills 1*	0	C

Part 2 (three terms)		*Credits*	*Level*
Compulsory Modules			
PM2PP2	*Pharmacy Practice 2*	20	I
PM2PB4	*Pharmacology and Toxicology*	10	I
PM2PB5	*Medical Microbiology*	10	I
PM2ES3	*Concepts & Skills 2*	5	I
PM2TH1	*Therapeutics 1*	15	I
PM2MP2	*The Formulation & Manufacture of Medicines*	10	I
AS2P1	*Statistics and Epidemiology for Pharmacy*	10	I
CH2A4	*Drug Analysis: A Theoretical & Practical Approach*	10	I
CH2MMP	*Medicinal Chemistry for Pharmacists*	20	I
FB2UOP	*Bioseparations Unit Operations*	10	I

Part 3 (three terms)		*Credits*	*Level*
Compulsory Modules			
PM3DS3	*The Use of Metals in Medicine*	10	H
PM3DS4	*Natural Products in Pharmacy and Medicine*	20	H
PM3MP3	*Advanced Pharmaceutics*	20	H
PM3PP3	*Pharmacy Practice 3*	20	H
PM3PP5	*Social Pharmacy*	5	H
PM3TH2	*Therapeutics 2*	20	H
PM3TH3	*Therapeutics 3*	25	H
PM3ES6	*Research Methods*	0	H

Part 4 (three terms)		*Credits*	*Level*
Compulsory Modules			
PM4ES7	*Integrated Patient Care and Diagnosis*	20	M
PM4ES8	*Research Project*	40	M
PM4PP4	*Pharmacy Practice 4*	10	M
PM4TH4	*Therapeutics 4*	20	M
PM4TH5	*Advanced Topics in Pharmacy with Electives*	30	M

Elective Modules (PM4TH5**):**
Students will select **at least two** of the following M- level lecture series from each of the 4 research disciplines:

Pharmacy Practice: Non-drug treatments (stomas, hosiery, surgical dressings); TENS; Specialist foods (gluten-free and low protein foods); Travel medicine; Business development.

Pharmaceutics: Advances in transdermal drug delivery, Novel delivery systems for pharmaceutical applications (including polymers, dendimers, hydrogels and biomaterials); Polymer-drug conjugates; Prediction of biomaterial compatibilities.

Pharmaceutical Chemistry: Rational drug design and synthesis; Recent advances in pro-drug design, modified oligonucleotide chemistry and metal based drugs; Germanium-based anti-cancer drugs.

Pharmacology: Gene therapy and genetic testing; Aptamers as drugs; New directions in drug discovery; Stem cells and tissue engineering; Novel treatment for neurodegenerative disease; Research ethics.

Progression requirements

Progression from Part 1 to Part 2
In order to progress from Part 1 to Part 2, a student shall normally be required to achieve the following in Part 1:

- an overall weighted average of at least 40% over 120 credits, and
- a mark of at least 40% in individual modules amounting to not less than 100 credits
- a mark of at least 35% in individual modules amounting to not less than 120 credits;
- A mark of at least 40% in the practical component of the relevant modules, as specified in the module descriptions.

Reassessment:
Students who have failed or are not qualified to progress to Part 2 are permitted one re-sit examination in each module in which they obtain less than 40%. The mark used for the purposes of progression will be the higher of the mark obtained in the original examination or the mark obtained in the re-examination.

Failure to Progress:
Students who do not meet the above requirements but gain a threshold performance, may be eligible to transfer to another programme or leave with a CertHE.
To gain a threshold performance at Part 1 a student shall normally be required to achieve:

- an overall average of 40% over 120 credits taken in Part 1, and
- a mark of at least 30% in individual modules amounting to not less than 100 credits.

Progression from Part 2 to Part 3
In order to progress from Part 2 to Part 3, a student shall normally be required to achieve the following in Part 2:

- an overall weighted average of at least 50% over 120 credits, and
- a mark of at least 40% in individual modules amounting to not less than 100 credits;
- a mark of at least 35% in individual modules amounting to not less than 120 credits;
- A mark of at least 40% in the practical component of the relevant modules, as specified in the module descriptions.

Reassessment:
Students who fail to progress are permitted one re-sit examination in each module in which they obtain less than 50%. For any module passed in a re-sit examination, the maximum mark carried forward into the final degree classification will be the higher of (a) the first attempt mark and (b) the lower of 40 and the mark achieved in the re-examination.

Failure to Progress:
Students who do not meet the above requirements for progression to Part 3 but gain a threshold performance, will be eligible for entry to Part 3 of the BSc Pharmaceutical Science. Alternatively, they may be eligible to transfer to another programme or leave with a DipHE.

To gain a threshold performance at Part 2 a student shall normally be required to achieve:

- an overall average of 40% over 120 credits taken in Part 2, and
- a mark of at least 30% in individual modules amounting to not less than 100 credits.

Progression from Part 3 to Part 4
In order to progress from Part 3 to Part 4, a student shall normally be required to achieve the following in Part 3:

- an overall weighted average of at least 50% over 120 credits, and
- a mark of at least 40% in individual modules amounting to not less than 100 credits
- a mark of at least 35% in individual modules amounting to not less than 120 credits
- A mark of at least 50% in both the Law & Ethics examination and the Dispensing examination. Compensation of marks for these subjects is not allowed.

Reassessment:
Students who fail to progress are permitted one re-sit examination in each module in which they obtain less than 50%. For any module passed in a re-sit examination, the maximum mark carried forward into the final degree classification will be the higher of (a) the first attempt mark and (b) the lower of 40 and the mark achieved in the re-examination.

Failure to Progress:
Students who do not meet the above requirements for progression to Part 4 but gain a threshold performance will be eligible for the award of a BSc Pharmaceutical Science.
To gain a threshold performance at Part 3 a student shall normally be required to achieve:

- an overall average of 40% over 120 credits taken in Part 3, and
- a mark of at least 30% in individual modules amounting to not less than 100 credits.

To Obtain the MPharm Degree
To obtain the MPharm Degree, a student shall normally be required to have satisfied all of the above progression requirements and to achieve the following in Part 4:

- an overall weighted average of at least 40% over Parts 2 , 3 and 4
- a mark of at least 40% in modules amounting to 120 credits in Part 4;

Reassessment:
Students who fail the degree are permitted one re-sit examination in each module in which they obtain less than 40%. For any module passed in a re-sit examination, the mark carried forward into the final degree assessment will be the higher of the original mark and the mark in the re-examination. A Candidate who is reassessed shall not be eligible for an Honours degree.

The RPSGB does not accept Aegrotat degrees for entry to the Registration Examinations for pharmacists.

Final Degree Classification
A student's final degree classification is made up of the following components:

- 20% of their overall average in Part 2
- 30% of their overall average in Part 3
- 50% of their overall average in Part 4

The grade structure for Bachelor's and undergraduate Master's degrees is as follows:

Grade	Mark	Classification
A	70% to 100%	First Class
B	60% to 69%	Second Class Division 1
C	50% to 59%	Second Class Division 2
D	40% to 49%	Third Class
E	35% to 39%	Below Honours Standard
F	30% to 34%	Fail
G	0% to 29%	Fail

Summary of teaching and assessment
Teaching is organised in modules that involve a combination of lectures, tutorials, workshops, practical sessions and private study. Modules are assessed by a mixture of coursework and formal examinations. At least 50% of the assessment will normally be by formal examination except for the Part 4 project, which will be assessed through laboratory work, the written report, a poster and an oral presentation.

Admission requirements
Entrants to this programme are normally required to have obtained:
Grade C or better in English and Mathematics in GCSE; and achieved
UCAS Tariff: 320 points including a minimum of 100 points from Chemistry and at least one other science.
International Baccalaureate: International Baccalaureate: 33 to include Chemistry at grade 6 or better and one other science at 6.
Irish Leaving Certificate: 320 points from 5 Higher level subjects with 90 points in Chemistry.
Two AS grades in relevant subjects are acceptable in place of one A-Level

Admissions Tutors: Dr R J Green and Dr C F Rawlinson.

Support for students and their learning
University support for students and their learning falls into two categories. Learning support includes IT Services, which has several hundred computers and the University Library, which across its three sites holds over a million volumes, subscribes to around 4,000 current periodicals, has a range of electronic sources of information and houses the Student Access to Independent Learning (S@IL) computer-based teaching and learning facilities. There are language laboratory facilities both for those students studying on a language degree and for those taking modules offered by the Institution-wide Language Programme. Student guidance and welfare support is provided by Personal Tutors, the Careers Advisory Service, the University's Disability Advisors, Study Advisors, Hall Wardens and the Students' Union. Within the School of Pharmacy additional training will be given in Problem Based Learning. Support will also be provided through practical classes and tutorials for every Part of the degree programme, and through community placements for the more vocational aspects of the course. A course handbook will be provided for all students, and problems may be raised for discussion through the School's Staff-Student Committee.

Career Prospects
Currently, there is a shortfall in the number of qualified Pharmacists within the hospital and community pharmacy sectors and this situation is predicted to continue for the foreseeable future. Therefore, a career in Pharmacy offers a wealth of opportunities for graduates. In order to qualify and practice as a Pharmacist, graduates must complete 12 months pre-registration training in an approved pharmaceutical environment after successful completion of the MPharm degree. The student must then pass the Royal Pharmaceutical Society of Great Britain (RPSGB) Registration Examination before they can register through the RPSGB as a Pharmaceutical Chemist (Pharmacist). After this time, graduates will be able to contribute to the development of pharmacy through employment within primary care centres, community, hospital or industry-based pharmacy departments, or through teaching and research and primary care organisations.
In addition to the vocational training for pharmacy the course provides a thorough grounding in the practical and theoretical skills required of science graduates enabling access to a wide range of careers in academic and commercial bioscience.

Opportunities for study abroad
There are no formal arrangements in place for studying abroad.

Placements

Placements in Part 1 will be of brief (½ or 1-day) duration and will be supervised by academic staff from the School or by Registered Pharmacists.

During Part 3, longer placements (1 week) take place in either community, industrial or hospital environments. These placements extend the experience of students in regard to the vocational skills and opportunities of pre-registration and registered pharmacists.

Arrangements for these will conform to the 'University Code of Practice on Placement Learning'.

Educational aims of the programme

The programme aims to provide a thorough degree level education in Pharmacy and this will form the first stage of professional training for the pharmacist. It aims to produce pharmacists who will successfully complete a further 12 months pre-registration training and who will subsequently pass the Royal Pharmaceutical Society of Great Britain (RPSGB) Registration examination. Specific aims are:-

- To provide the necessary knowledge to interpret and evaluate prescriptions and other orders for medicines and to supply medicines in accordance with pharmaceutical knowledge, legislation, ethical guidelines and codes of professional conduct and practice.
- To develop communication skills, especially the knowledge and ability to communicate with patients and other health care professionals about medicines and their safe usage, medicine management and pharmaceutical care.
- To develop the ability to evaluate scientific evidence and to formulate appropriate conclusions.
- To develop an understanding of the roles of the professional pharmacist, in community and in hospital practice and in the pharmaceutical industry.
- To develop the skills and aptitudes necessary for a lifetime of effective, independent learning.
- To develop a multidisciplinary and integrative approach to healthcare.
- To develop subject-specific and transferable skills.
- To acquire the skills to manage effectively their career and gain appropriate employment.

Programme Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:-

Knowledge and Understanding

A. Knowledge and understanding of:

1. the fundamental concepts and techniques of pharmacy including human biology, medicinal chemistry, analytical chemistry, disease states, biotechnology, statistics, pharmacy practice and social pharmacy.
2. the necessary knowledge to interpret and evaluate prescriptions and other orders for medicines, and the relevant legal and ethical guidelines.
3. the knowledge of sources of medicinal agents and an understanding of how medicines are designed, developed, purified, characterised, analysed, manufactured and brought to the market place.
4. an understanding of medicine formulation.
5. an understanding of the physical and chemical properties of the materials that are contained within medicines, to ensure safe and effective usage.
6. an understanding of how medicines affect the body and how the body interacts with and metabolises drugs.
7. a selection of more specialist topics in the areas of Nutrition in Pharmacy, Clinical toxicology, Immunisation therapies for the future, Rational Drug design, Pharmacogenomics, Business development, Production and Characterisation of drugs, Herbalism, Bioinformatics in Pharmacy and Drugs in the developing world.
8. the main skills required for practical pharmacy including the recognition of disease symptoms, the promotion of good health and the prescription of medicines.
9. the spectroscopic methods used to identify molecules and to determine their structure and the basic principles of the underlying theory.

Teaching/learning methods and strategies

The knowledge required for the basic topics is provided in formal lectures supported by problem sets for students to tackle on their own and which are discussed formally in tutorial sessions with members of staff.

2. is addressed particularly during Parts 3 and 4 of the course.

3. and 4. are addressed particularly during Part 2 of the course.

6. is addressed particularly during the Therapeutic modules of Parts 2, 3 and 4.

7. is addressed particularly during Part 4 of the course.

8. is addressed in practical classes held throughout Parts 1, 2 & 3 in which students develop their skills prior to applying them in their Part 4 project. More specialised Pharmacy skills are particularly in the Pharmacy Practice and Therapeutics modules and the Essential Skills modules in Parts 3 and 4.

9. is addressed particularly during the analytical chemistry modules of Part 2

Feedback on student work is provided by the discussion and return of work in tutorials and by regular workshop sessions during which students tackle unseen problems in the presence of academic staff who provide support.
All practical work is marked and returned to the student.

Assessment

Most knowledge is tested through a combination of coursework and unseen formal examinations, 8 are assessed by coursework. Dissertations and oral presentations also contribute to assessment, particularly in Part 4.

Skills and other attributes

B. Intellectual skills – able to: 1. think logically 2. analyse and solve problems including diagnosis of disease and prescription of medicines 3. perform pharmaceutical calculations accurately and to critically appreciate the interrelationship between formulation, drug delivery and therapeutic effectiveness. 4. gather information, make logical deductions and think critically through the application of rational deductive clinical reasoning. 5. organise tasks into a structured form 6. understand the evolving state of knowledge in a rapidly developing area 7. transfer appropriate knowledge and methods from one topic within the subject to another 8. plan, conduct and write a report on an independent project 9. construct a poster.	**Teaching/learning methods and strategies** Logic is an essential part of the understanding and construction of scientific principles impacting on pharmacy. Training and experience in Problem based learning, particularly during Part 3, will assist with the analysis and solution of problems. Latest developments in the subject will be introduced where appropriate, particularly in Part 4. Subject matter will be presented in an integrated approach, enhancing training in 5. Practical reports in Part 1, 2 & 3 provide training for the Part 4 project report. ***Assessment*** 1-7 are assessed directly and indirectly in most parts of this MPharm course, while 5 contributes to the most successful work. 8 & 9 are assessed in the Part 4 project report.
C. Practical Skills:- be able to 1. follow practical instructions safely and accurately 2. prepare, package and dispense medicines safely and efficiently 3. prepare extemporaneously any medicine for which this would be regarded as the normal means of provision, including by aseptic techniques. 4. carry out a variety of chemical, biological and biotechnological, experimental procedures 5. measure and interpret various spectroscopic values 6. interpret quantitatively the results of their experiments 7. formulate safety protocols 8. operate according to quality assurance mechanisms in synthesis, formulation and packaging processes. 9. devise suitable experimental methods for tackling a particular problem. 10. operate within standard operating procedures, including Patient Group Directions.	**Teaching/learning methods and strategies** **Detailed practical manuals are provided for all practical courses in Parts 1 & 2, together with sources of recommended further reading. Staff and post-graduate demonstrators are present during every practical session to guide and help students and to mark their reports.** In Parts 2, 3 and 4 PBL exercises in Therapeutics modules are undertaken by small teams of students In Part 4 students work on individual projects under the supervision of one or more members of staff. ***Assessment*** 1 to 6 are tested to different extents by the practical work associated with Parts 1 - 3 of the pharmaceutical chemistry, pharmacology and pharmaceutics modules. 5 is assessed through problems set in written examinations. 7 is specifically assessed during the chemistry practical courses in Parts 1 and 2, although safe working procedures are emphasised at every stage. 8 and 9 are assessed in the Part 2 and 3 Pharmaceutics modules and in Unit Operations in Part 2 and the Part 4 Research Project.

D. Transferable skills – able to: 1. communicate with members of the public as well as other health care professionals 2. work as part of a team and as an individual 3. manage time 4. use IT (relating to pharmacy, word-processing, spreadsheets and chemical databases) 5. communicate scientific ideas 6. give oral presentations 7. use library and other information resources 8. plan their career.	**Teaching/learning methods and strategies** The programme will deliver skills in a wide range of modules. The importance of communication and the ability to work alone or as part of a team is emphasised throughout the programme and is assisted through workshops, placements and the small group work associated with Therapeutics and other modules throughout the programme. The challenging degree programme will require students to develop effective time management. The use of IT is embedded throughout the programme. Oral presentations will be required within the Pharmacy practice modules. Library resources are specifically addressed within the fourth year project. ***Assessment*** These skills will be assessed in the Concepts and Skills modules and in Pharmacy Practice 1 (PM1PP1). They will also be assessed through placements, presentations and written reports for case studies and other modules and the Part 4 research project.

Please note: This specification provides a concise summary of the main features of the programme and the 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 learning outcomes, content and teaching, learning and assessment methods of each module can be found in the study module guide and programme handbook