MPharm Pharmacy **UCAS code: B230**
For students entering Part 1 in 2007/8

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	Pharmacy
Faculty:	Life Sciences
Programme length:	4 years
Date of specification:	07/Dec/2010
Programme Director:	Dr Gary Stephens
Programme Advisor:	Prof Elizabeth Williamson
Board of Studies:	Pharmacy
Accreditation:	Royal Pharmaceutical Society of Great Britain (RPSGB)

Summary of programme aims
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 modules, all of which are compulsory. The number of credits for each module is given after its title.

Part 1 (three terms)
Compulsory modules

Module	*Title*	*Credits*	*Level*
AM1P11	Introductory Microbiology	10	4
AM1P14	Biochemistry and Metabolism	10	4
BI1BA1	The Living Cell	10	4
BI1BC2	Genes and Chromosomes	10	4
CH1MP1	Physicochemical Principles of Pharmacy	10	4
PM1DS1	Basic Organic Chemistry	20	4
PM1ESA	Concepts and Skills 1	0	4
PM1MP1	Formulation and Stability of Medicines	10	4
PM1PB2	Human Physiology	20	4
PM1PP1	Pharmacy Practice 1 (incl. placements)	20	4

Part 2 (three terms)
Compulsory modules

Module	*Title*	*Credits*	*Level*
AS2P1	Statistics and Epidemiology for Pharmacy	10	5

CH2A4	Drug Analysis: A Theoretical and Practical Approach	10	5
CH2MMP	Medicinal Chemistry for Pharmacists	20	5
FB2UOP	Unit Operations	10	5
PM2ES3	Concepts and Skills 2	0	5
PM2MP2	Dosage Form Design	10	5
PM2PB4	Introduction to Pharmacology and Toxicology	10	5
PM2PB5	Medical Microbiology	10	5
PM2PP2	Pharmacy Practice 2	20	5
PM2TH1	Therapeutics 1	20	5

Part 3 (three terms)
Compulsory modules

Mod Code	*Module Title*	*Credits*	*Level*
PM3PP3	Pharmacy Practice 3	20	6
PM3PP5	Social Pharmacy	10	6
PM3DS3	The Uses of Metals in Medicine	10	6
PM3DS4	Natural Products in Pharmacy and Medicine	20	6
PM3ES6	Research Methods	0	6
PM3TH2	Therapeutics 2	20	6
PM3TH3	Therapeutics 3	20	6
PM3MP3	Advanced Pharmaceutics	20	6

Part 4 (three terms)
Compulsory modules

Mod Code	*Module Title*	*Credits*	*Level*
PM4PP4	Pharmacy Practice 4	10	7
PM4TH4	Therapeutics 4	20	7
PM4TH5	Advanced Topics in Pharmacy with Associated Electives	30	7
PM4ES7	Integrated Patient Care and Diagnosis	20	7
PM4ES8	Research Projects	40	7

Elective Modules:
Students will select **at least two** Level 7 lecture series from each of the four research disciplines (to be attended in the Part 4 module PM4TH5) and will develop an Elective topic under the supervision of a member of academic staff.

Research Projects Titles:
Students will devise or select a project title from a list provided, and develop and implement it in the Part 4 module (PM4ES8) under the supervision of a member of academic staff.

Progression requirements
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 40% over 120 credits; and
- a mark of at least 40% in individual modules amounting to not less than 100 credits; and
- a mark of at least 35% in individual modules amounting to not less than 120 credits; and
- successful completion of specified coursework and / or examination components of relevant modules, as described in the module descriptions.

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 and the mark obtained in the re-examination.

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

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; and
- a mark of at least 35% in individual modules amounting to not less than 120 credits; and
- successful completion of specified coursework and / or examination components of relevant modules, as described in the module descriptions.

Students who fail to progress are permitted one re-sit examination in each module in which they obtain less than 50% or fail to meet the progression requirements. 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.

Students who do not meet the above requirements for progression to Part 3 but gain a threshold performance 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.

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; and
- a mark of at least 35% in individual modules amounting to not less than 120 credits; and
- successful completion of specified coursework and / or examination components of relevant modules, as described in the module descriptions, including a mark of at least 50% in both the PM3PP3 Law and Ethics examination and the PM3PP3 Dispensing examination; compensation of marks for these subjects is not allowed.

Students who fail to progress are permitted one re-sit examination in each module in which they obtain less than 50% or fail to meet the progression requirements. 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.

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 BSc Pharmaceutical Science. The classification for this exit award will be based 33% upon the overall weighted average in Part 2 and 67% the overall weighted average in Part 3. To gain a threshold performance at Part 3, a student shall normally be required to achieve:

- an overall weighted 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, 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; and
- a mark of at least 40% in each module amounting to 120 credits in Part 4; and
- successful completion of specified coursework and / or examination components of relevant modules, as described in the module descriptions.

Students who fail the degree are permitted one re-sit examination in each Part 4 module in which they have achieved less than 40%. For any such module which is subsequently passed in the re-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 has failed to achieve 40% in each module at the first sitting shall be penalised by dropping one degree classification.

Students who pass a module but fail a required 'K' element of the module will be permitted to re-sit the required 'K' element on one occasion only and the element will be graded Pass or Fail; the original overall module mark achieved will be carried-forward into their final degree calculations. No re-sit classification penalty will be applied in these circumstances.

Students who do not meet the above requirements for obtaining the MPharm degree will be eligible for the award of BSc Pharmaceutical Science. The classification for this award will be based 33% upon the overall weighted average in Part 2 and 67% the overall weighted average in Part 3.

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

A student's final degree classification for the MPharm is weighted as follows:
- Overall weighted average in Part 2 contributes 20%;
- Overall weighted average in Part 3 contributes 30%;
- Overall weighted average in Part 4 contributes 50%.

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

Grade	**Mark**	**Classification**
A	70-100	First Class
B	60-69	Second Class, Division 1
C	50-59	Second Class, Division 2
D	40-49	Third Class
E	35-39	Below Honours standard
F	30-34	Fail
G	0-29	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 research (such as laboratory work or systematic review) and the written report.

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: Pass International Baccalaureate diploma including Higher Level scores of 6 6 5 including Chemistry.
Irish Leaving Certificate: AABBBB in Higher Level to include Chemistry and Biology.
Two AS grades in relevant subjects are acceptable in place of one A-Level.

Admissions Tutor: Dr R J Green and Dr K Strohfeldt-Venables

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, School Senior Tutors, the Students' Union, the Medical Practice and the Student Services Directorate. The Student Services Directorate is housed in the Carrington Building and includes the Careers Advisory Service, the Disability Advisory Service, Accommodation Advisory Team, Student Financial Support, Counselling and Study Advisors. Student Services has a Helpdesk available for enquiries made in person or online (www.risisweb.reading.ac.uk), or by calling the central enquiry number on (0118) 378 5555. Students can get key information and guidance from the team of Helpdesk Advisers, or make an appointment with a specialist adviser; Student Services also offer drop-in sessions on everything from accommodation to finance. The Carrington Building is open between 8:30 and 17:30 Monday to Thursday (17:00 Friday and during vacation periods). Further information can be found in the Student website (www.reading.ac.uk/student).

Within Reading 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 MPharm 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 or for placements
There are no formal arrangements in place for studying abroad.

Placements in Part 1 will be of brief (0.5 or 1-day) duration and will be supervised by academic staff from Reading School of Pharmacy 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'.

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:	**Teaching/learning methods and strategies**
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.	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 and 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

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.	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 is assessed by coursework. Dissertations and oral presentations also contribute to assessment, particularly in Part 4.

Skills and other attributes

B. Intellectual skills - *able to:*	**Teaching/learning methods and strategies**
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.	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 and 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 is assessed in the Part 4 project report; 9 during Part 3.

C. Practical skills - *able to:*	**Teaching/learning methods and strategies**
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.	Detailed practical manuals are provided for all practical courses in Parts 1 and 2, together with sources of recommended further reading. Staff and postgraduate 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

9. Devise suitable experimental methods for tackling a particular problem.
10. Operate within standard operating procedures, including Patient Group Directions.

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 (PM2MP2 and PM3MP3) and in Unit Operations (FB2UOP) project in Part 3 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 module description and in the programme handbook. The University reserves the right to modify this specification in unforeseen circumstances, or where the process of academic development and feedback from students, quality assurance process or external sources, such as professional bodies, requires a change to be made. In such circumstances, a revised specification will be issued.