

**BSc Pharmaceutical Science**  
**For students entering Part 1 in 2009/0**

**UCAS code:**

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	Pharmacy
Faculty:	Life Sciences Faculty
Programme length:	3 years
Date of specification:	22/Mar/2011
Programme Director:	Dr Becky Green
Programme Advisor:	Prof Elizabeth Williamson
Board of Studies:	Pharmacy
Accreditation:	N/A

**Summary of programme aims**

The programme aims to provide a modern, innovative and integrated degree-level education in Pharmaceutical Sciences and Pharmacy that meets the standards of the University. It provides an exit route for students who do not satisfy the progression requirements for MPharm at Part 3 or Part 4.

The BSc 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**

During the course of their studies at Reading, all students will be expected to enhance their academic and personal transferable skills in line with the University's Strategy for Learning and Teaching. In following this programme, students will have had the opportunity to develop such skills, in particular relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team-working, and use of information technology and will have been encouraged to further develop and enhance the full set of skills through a variety of opportunities available outside their curriculum.

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 BSc degree programme follows the same syllabus as MPharm for Parts 1, 2 and 3. 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; each Part comprises modules totalling 120 credits.

**Part 1 (three terms)**

*Compulsory modules*

<i>Code</i>	<i>Module title</i>	<i>Credits</i>	<i>Level</i>
PM1PP1	Pharmacy Practice I	20	4
PM1PB2	Human Physiology	20	4
PM1DS1	Drug Design and Synthesis: Basic Organic Chemistry	20	4
PM1ESA	Concepts and Skills 1	0	4
AM1P14	Biochemistry and Metabolism	10	4
BI1BA1	The Living Cell	10	4
BI1BC2	Genes and Chromosomes	10	4
AM1P11	Introductory Microbiology	10	4
PM1PH1	Physicochemical Principles of Pharmacy	20	4

## Part 2 (three terms)

### Compulsory modules

<i>Code</i>	<i>Module title</i>	<i>Credits</i>	<i>Level</i>
PM2PP2	Pharmacy Practice 2	20	5
PM2PB4	Introduction to Pharmacology and Toxicology	10	5
PM2PB5	Medical Microbiology	10	5
PM2ES3	Concepts and Skills 2	0	5
PM2TH1	Therapeutics 1	20	5
AS2B1	Statistics and Epidemiology for the Life Sciences	10	5
PM2MMP	Medicinal Chemistry for Pharmacists (Drug Targets)	20	5
CH2AN2	Drug Analysis: A Theoretical and Practical Approach	10	5
PM2PH2	Dosage Form Design and Manufacturing	20	5

## Part 3 (three terms)

### Compulsory modules

<i>Code</i>	<i>Module title</i>	<i>Credits</i>	<i>Level</i>
PM3PP3	Pharmacy Practice 3	20	6
PM2PP5	Social Pharmacy	10	6
PM3DS3	The Uses of Metals in Medicine	10	6
PM3DS4	Natural Products in Pharmacy and Medicine: Pharmacognosy	20	6
PM3ES6	Research Methods	0	6
PM3TH2	Therapeutics 2	20	6
PM3TH3	Therapeutics 3	20	6
PM3MP3	Advanced Pharmaceutics	20	6

## 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;
- successful completion of specified coursework and/or examination components of relevant modules, as described 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 fail to meet the progression requirements. 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.

### 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;
- successful completion of specified coursework and/or examination components of relevant modules, as described 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% 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.

**Failure to Progress:**

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.

**To Obtain the BSc Pharmaceutical Science Degree**

To obtain the Degree, a student shall normally be required to have satisfied all of the above progression requirements and to achieve the following in Part 3:

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

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

<b>Grade</b>	<b>Mark</b>	<b>Classification</b>
A	70% - 100%	First Class
B	60% - 69%	Upper Second Class
C	50% - 59%	Lower Second Class
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 70% of the assessment will normally be by formal examination.

**Admission requirements**

There is no direct entry to this programme; the programme provides an exit route for students who do not satisfy the progression requirements for MPharm at Part 3 or Part 4.

**Support for students and their learning**

University support for students and their learning falls into two categories. Learning support is provided by a wide array of services across the University, including: the University Library, the Careers Advisory Service, In-sessional English Support Programme, the Study Advice and Mathematics Support Centre teams, IT Services and 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 and Counselling. Student Services has a Helpdesk available for enquiries made in person or online ([www.risisweb.reading.ac.uk](http://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](http://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**

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 consist of a half-day visit to a hospital in the Autumn Term and, in the Easter vacation, a one-day visit to a community pharmacy; these visits will be supervised by either academic staff from Reading School of Pharmacy or by local Registered Pharmacists.

During Part 3, longer placements (minimum of one week) will 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 guidelines set by the General Pharmaceutical Council and 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:**

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. the main skills required for practical pharmacy including the recognition of disease symptoms, the promotion of good health and the prescription of medicines.
8. 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 Part 3 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 and 3.
7. is addressed in practical classes held throughout Parts 1, 2 & 3 in which students develop their skills. More specialised Pharmacy skills are particularly in the Pharmacy Practice and Therapeutics modules and the Essential Skills modules in Part 3.
8. 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. 7 is assessed by coursework. Dissertations and oral presentations also contribute to assessment..

### 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. construct a poster.

#### C. Practical skills - *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.

#### 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

#### 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. Subject matter will be presented in an integrated approach, enhancing training in 5.

#### Assessment

1-7 are assessed directly and indirectly in most parts of the course, while 5 contributes to the most successful work. 8 is assessed during Part 3.

#### Teaching/learning methods and strategies

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 and 3, PBL exercises in Therapeutics modules are undertaken by small teams of students.

#### 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 Dosage Form Design and Manufacturing in Part 2.

#### 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

7. Use library and other information resources
8. Plan their career.

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.

**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.**