

## Faculty of Life Sciences

### Programme Specification

Programme title: **Pharmaceutical Technology**

Academic Year:	2017-18
Degree Awarding Body:	University of Bradford
Partner(s), delivery organisation or support provider (if appropriate):	N/A
Final and interim award(s):	[Framework for Higher Education Qualifications level 7] MA/MSc Postgraduate Diploma Postgraduate Certificate
Programme accredited by (if appropriate):	N/A
Programme duration:	1 year full-time
QAA Subject benchmark statement(s):	N/A
Date of Senate Approval::	August 2014
Date last confirmed and/or minor modification approved by Faculty Board	

#### Introduction

This programme is designed to continue the University of Bradford's long track record of developing innovative curricula in line with the needs of world-wide industry. The pharmaceutical industry is globally growing at a considerable pace and due to changing business dynamics, innovative pharmaceutical processing technologies are gaining importance. The increasing significance of technologies for manufacturing advanced drug delivery systems and the need to comply with stringent regulatory requirements has raised demand for manpower with specialist skills in the area of pharmaceutical technology.

The interdisciplinary postgraduate programme in Pharmaceutical Technology has been developed taking into consideration the requirements of the global pharmaceutical industry and the strong infrastructure and expertise available across the Faculty of Life Sciences and Engineering Design & Technology.

This complements the current aspirations of strengthening research interactions across the two disciplines.

This programme will be hosted by the Bradford School of Pharmacy which is situated on the main University campus. The programme is interdisciplinary in structure and will be supported by the University Analytical Centre and Centre for Pharmaceutical Engineering Science. The programme is unique and will provide students with a wider exposure to and understanding of pharmaceutical technologies, delivery systems and process analytics.

### **Programme Aims**

The programme is intended to:

- provide an opportunity to develop a comprehensive understanding and knowledge in the area of pharmaceutical formulation development and its underpinning science and processes.
- develop an understanding of the application of analytical techniques in pharmaceutical formulation development.
- provide an insight into regulatory requirements for licensing pharmaceuticals and application of Process Analytical Technologies (PAT) in process development and the manufacture of pharmaceuticals.
- provide an opportunity to develop a conceptual understanding that enables the student to evaluate critically current research and, where appropriate, to propose new hypotheses.
- develop transferable skills including scientific literature searching and evaluating, reporting and presenting scientific information.

### **Programme Learning Outcomes**

To be eligible for the award of Postgraduate Certificate at FHEQ level 7, students will be able to:

- LO1 deal with complex issues related to pharmaceutical formulation and processing technologies both systematically and creatively.
- LO2 understand and evaluate the application of different techniques in preformulation and formulation development.
- LO3 understand and demonstrate the application of different analytical techniques for the characterisation of the physico-chemical properties of drug substances, and understand the optimisation of complex process.

LO4 demonstrate the qualities and transferable skills required to exercise initiative and personal responsibility and decision making in complex and unpredictable situations

Additionally, to be eligible for the award of Postgraduate Diploma at FHEQ level 7, students will be able to:

LO5 understand and evaluate the application of different techniques in process analytics.

LO6 critically evaluate scientific literature and communicate scientific information both in writing and orally.

LO7 demonstrate independent learning and the critical thinking ability required for continuing professional development.

Additionally, to be eligible for the award of Degree of Master at FHEQ level 7, students will be able to:

LO8 demonstrate originality in application of knowledge, together with practical understanding of research techniques in an area within the pharmaceutical sciences.

LO9 demonstrate self-direction and originality in implementing a research project; employ appropriate experimental approaches and report your findings in relation to current research knowledge and understanding.

## Curriculum

### Postgraduate Certificate

FHEQ Level	Module Title	Core/ Option/ Elective	Credits	Study Period	Module Code
6	Fundamentals of Drug Delivery	Core	20	1	PHA6005-B
7	Science of Solid Dosage Forms & Advanced Pharmaceutical	Core	20	1	PHA7007-B

	Technologies				
7	Solid Analysis	Core	20	1	CFS7026-B

Students will be eligible to exit with the award of Postgraduate Certificate if they have successfully completed 60 credits and achieved the award learning outcomes.

#### Postgraduate Diploma

FHEQ Level	Module Title	Core/ Option/ Elective	Credits	Study Period	Module Code
7	Critical Appraisal of a Current Topic in Pharmaceutical Sciences	Core	20	2	PHA7005-B
7	Process Analytical Technologies (PAT)* & Quality by Design (QbD)	Core	20	2	PHA7050-B
7	Separation Science and Mass Spectrometry*	Optional	20	2	CFS7027-B
7	Imaging*	Optional	20	2	CFS7028-B

Students will be eligible to exit with the award of Postgraduate Diploma if they have successfully completed at least 120 credits and achieved the award learning outcomes.

#### Degree of Master

FHEQ Level	Module Title	Core/ Option/ Elective	Credits	Study Period	Module Code
7	Research Project	Core	60	3	PHA7011-E

Students will be eligible for the award of Degree of Master if they have successfully completed at least 180 credits and achieved the award learning outcomes.

## Learning and Teaching strategy

The teaching and learning strategy for this programme is based on University of Bradford Learning Teaching and Assessment Strategy and Faculty of Life Sciences Learning and Teaching Plans. It takes into consideration the aims and learning outcomes of the programme, progression through the levels of study, the nature of the subject and the need for you to take greater responsibility for your own learning as you progress through the programme.

A wide variety of teaching and learning methods will be employed to engage you in developing your subject knowledge and understanding including formal lectures, laboratory practical sessions, demonstrations, seminars, workshops, laboratory investigations, critical appraisal, coursework assignments and directed study. The programme will progress from structured learning led by lectures and practical through more seminar based learning to individual research based dissertation and project.

- The University of Bradford is well known for attracting students from a wide variety of background, experiences and countries. This programme is particularly suitable for overseas students and will cater for students from a range of previous educational backgrounds. The programme will start with fundamental aspects of formulation development which will give all students the appropriate level from which they can develop advanced understanding in the area of pharmaceutical technology. This and the learning facilities available to all students provide the conditions for students to develop and manage their learning. The University of Bradford's mission, "Making Knowledge Work", is imbedded in the philosophy of this programme.
- Student choice is important in developing ownership of your learning and fostering deep learning. In the modules marked \* in the curriculum students may indicate their choice of study subject by the third week of the study period
- To give time to support and explore the potential subjects for later learning in depth, the research supervisor for an individual student will be allocated in first semester study period and the research project topic will be finalised by student and respective supervisor during this period.
- The teaching and learning methods implemented to engage students in developing their knowledge and understanding as mentioned in LO1 to LO3 and LO5 include formal lectures (including those from Visiting Lecturers from pharmaceutical companies), laboratory coursework, project work, directed learning and individual work.
- Expert and peer advice and support during laboratory experimental exercises, case studies, critical appraisal of current topics and supervised research or project work will allow the student to develop his/her intellectual skills as expected in LO6 to LO9.
- The modules of advanced analytical techniques provide an opportunity for

students to integrate their knowledge of formulation development and processing and achieve LO2 and LO5.

- The methods implemented in developing the students' practical skills include demonstrations and practical sessions linked with the taught modules. MSc students will also design formulations, use analytical techniques, develop skills in using software applications and use control and measuring instruments under supervision during the initial phase of their research project.
- The opportunities to develop critical thinking and problem solving skills that explore the sustainable development challenge related to responsible science or responsible professionalism will be provided through workshops on health and safety, including professional development programmes from the learner development unit. In first four weeks students will undergo at least four workshops at least one hour each, organised by LDU mainly regarding referencing, plagiarism, presentation skills and critical analysis. The timetable for workshops will be provided to the students. Modules like critical appraisal of current topics in pharmaceutical technology, process analytical technology and processing technologies (especially green technologies) and research project will debate utilisation of the principles of responsible science, using case based teaching approaches that examine the dilemmas and challenges of sustainable development.
- Development of your transferable skills (LO4) should occur throughout the programme. It will mainly occur through preparation and presentation of critiques, project reports, laboratory reports and seminars. Implementation of the research project in the third semester will provide the students with an opportunity to learn about effective planning, time management, interpersonal skills and professional responsibility.

## Assessment Strategy

We use a variety of assessment methods across modules to reflect the range of learning outcomes in the programme and to allow the students to demonstrate their knowledge and achievement:

- The methods of assessment to assess your knowledge and understanding in LO1 to LO3 and LO5 will include written examination, evaluation of project reports, presentations and experimental coursework.
- The methods of assessment of intellectual skills include written examinations, presentation of a critique of published research articles and experimental coursework, and most importantly, an MSc dissertation (outcomes LO6 to 9).
- The methods of assessment of practical skills include verbal or written feedback on laboratory work linked with the taught modules. The presentation and appropriate use, understanding and analysis of these methods will be assessed through the MSc dissertation.
- The methods of assessment of transferable skills are built into the structure of the examinations, case studies, and research or project work.

## Assessment Regulations

This Programme conforms to the standard University Regulations which are available at the following link:

<http://www.bradford.ac.uk/aqpo/ordinances-and-regulations/>

## Admission Requirements

The University welcomes applications from all potential students and most important in the decision to offer a place is our assessment of a candidate's potential to benefit from their studies and of their ability to succeed on this particular programme. Consideration of applications will be based on a combination of formal academic qualifications and other relevant experience.

The standard entry requirements for the programme are as follows:

As a general guideline, acceptance on the Masters programme requires first degree at Honours or equivalent (2: 2) in a relevant area such as Biological Sciences, Chemistry, Pharmacy, Pharmacology or Pharmaceutical Sciences.

Applicants whose first language is not English will need to demonstrate proficiency in English in accordance with University Regulations. All students must satisfy the English language requirements for admission as described in <http://www.brad.ac.uk/international/english-prepare.php>. If your native language is not English, you will have to pass a test in English approved by the University before you can be admitted. The following qualification is acceptable as satisfying this requirement:

- The International English Language Testing Service Test (IELTS) administered by the British Council is the test which is preferred by the University. You will need to achieve an Overall Band of at least 6, with at least 5.5 in each of the four sub-tests. Testing facilities are available at most British Council overseas offices. When you take your test, you should ask for a copy of your Test Report Form to be sent to the University.

Applications are welcome from students with non-standard qualifications or mature students (those over 21 years of age on entry) with significant relevant experience.

### **Recognition of Prior Learning**

If applicants have prior certificated learning or professional experience which may be equivalent to parts of this programme, the University has procedures to evaluate and recognise this learning in order to provide applicants with exemptions from specified modules or parts of the programme.

### **Minor Modification Schedule**

<b>Version Number</b>	<b>Brief description of Modification</b>	<b>Date of Approval (Faculty Board)</b>
1	Update to curriculum to align with outcome of Periodic Review for MSc Analytical Sciences. LOs separated for PGC, PGD and MSc. Updated LO mapping provided.	Approved by ADLT acting under delegated authority (April 2017)