UNIVERSITY of BRADFORD
Faculty of Life Sciences

Master by Research

Programme Specification: MRes Drug Development

https://www.bradford.ac.uk/courses/pg/master-by-research/

Academic Year: 2024/25
Degree Awarding Body: The University of Bradford
Target award: Degree of Master by Research [Framework for Higher Education Qualifications level 7]
Interim awards: Postgraduate Diploma [FHEQ Level 7]; Postgraduate Certificate [FHEQ Level 7]
Programme Pathways: Cancer Drug Discovery, Cancer Pharmacology, Chemical Biology, Drug Toxicology and Safety Pharmacology, Molecular and Cell Biology, Pharmaceutical Technology
Programme Admissions: September
Programme Duration: 1 year full time
Date last confirmed: and/or minor modification approved by Faculty Board **April 2024**

Please note: This programme specification has been published in advance of the academic year to which it applies. The curriculum may change, subject to the University's programme monitoring and review processes. Every effort has been made to ensure that the information is accurate at the time of publication, but changes may occur given the interval between publishing and commencement of teaching. Any change which impacts the terms and conditions of an applicant's offer will be communicated to them. Upon commencement of the programme, students will receive further detail about their course and any minor changes will be discussed and/or communicated at this point.

Minor Modification Schedule

1. October 2020: Confirmed COVID-19 accommodations including temporary January entry
2. June 2021: Return to standard delivery mode. Specification reformatted for accessibility regulations. Updated links, Admissions and Study Abroad sections.
3. March 2022: Minor changes for 2022 academic year.

Programme Aims

Master by Research (MRes) is a one-year research-focused postgraduate programme run by the Faculty of Life Sciences. It provides training for working in a professional environment, or in preparation for a PhD.

The programme places a strong emphasis on developing laboratory-based research skills and expertise. A central core of modules in Semester 1 trains students in widely-used laboratory techniques, research methodology, and in critical analysis and thinking. This is complemented with a subject-specialist module. A six-month research component in the programme provides a strong opportunity to acquire skills and to put them into practice by carrying out cutting edge research with a real-world impact.

The main aim of the programme is to provide a student experience organised around research-engaged learning where the classroom and lab are 'sites' of the production and application of new knowledge. To achieve this, the curriculum is designed around the principle of 'spiral learning' where core skills, knowledge, and competences are reinforced and developed as the student moves chronologically and sequentially through the programme. The approach to assessment for learning is not only aligned to both the spiral curriculum and the principle of research-engaged learning, but also is authentic in the sense of encompassing the disciplinary and professional skills that students will need to pursue careers in the associated scientific and academic fields.

The scientists at the Faculty of Life Sciences are situated in laboratories at the heart of the University of Bradford campus. Members of the Faculty have an international reputation in diverse fields like cancer sciences, pharmaceutical technology, chemical biology, drug discovery and skin and regenerative medicine sciences. Research in our faculty is multidisciplinary, incorporating a broad spectrum of skills ranging from chemistry to engineering, to preclinical investigation of drugs. The Faculty has excellent facilities exemplified by a £3M Analytical Centre and purpose-built laboratories at the Institute of Cancer Therapeutics.

During Semester 1, students gain knowledge of cutting-edge research at the Faculty and either choose or suggest a research project plan. The MRes project modules' assessments in Semester 2 and Semester 3 are designed to work together to provide real skills needed in research-active scientists:

- For example, in Semester 2, students are tasked with peer-reviewing a scientific paper, writing a research report based on their project background knowledge, aims and initial results, and submitting a scientific abstract for a poster.
- During a number of other specialist workshops in Semester 2 students work as part of a team to solve problems set by the workshop leader, on subjects and skills that directly inform the conduct of research, such as health and safety and statistical analysis.
- Employability, and skills that enhance it, are a strong feature running through the curriculum design. For example, in Semester 2 students attend a workshop about writing their academic/professional CV and in Semester 3 they participate in a mock job/PhD interview based on their CV.
- In Semesters 2 and 3, students will join research laboratories within the Faculty, where they are trained in specialist laboratory techniques and conduct their chosen research. The large research element in this postgraduate programme enables students to undertake substantial and ambitious projects, some of which will result in publications in high-impact scientific journals.
- In Semester 3, students prepare and present their poster at the Faculty-wide Research Open Day, to which all University internal and external stakeholders are invited. Students also write their dissertation and deliver a presentation about their research project.

Throughout the curriculum, and specifically through these workshops, the programme instils self-reflection and teamwork in students. The programme promotes advanced

scholarship within specialised areas concomitant with the development of key transferable skills (in IT, communication, research and analysis) and practical research techniques. The programme uses a range of teaching strategies to promote independent study and research, to develop a systematic and critical understanding, and enhance autonomous learning and transferable personal skills. This programme will facilitate the development of the skills students require for careers in academia and industry. Enhancement of independent learning skills during the programme will equip students with the competence to succeed as lifelong learners.

Through these mechanisms, the MRes programme meets the demands of employers and students at postgraduate level and prepares its graduates for progression to employment in their chosen field or to PhD study.

In summary, the programme is intended to:

A1 Enable students to develop a systematic understanding and critical awareness of key and specialised research skills, practical methodologies and laboratory techniques for research in life sciences.

A2 Develop an ability to collate scientific information and critically appraise scientific data and research methodology.

A3 Give students an advanced knowledge of principles underpinning their field of specialism.

A4 Develop skills in scientific communication, research design and scientific methods.

A5 Develop students' ability in a range of personal, transferable and key skills.

A6 Enable students to think critically and to further develop as autonomous and lifelong learners.

A7 Enable students to develop as advanced experimental researchers in their field of specialism within life sciences.

A8 Provide a supportive educational environment which meets the needs of students from a variety of backgrounds.

Admission Requirements

We take into consideration a number of factors when assessing your application. It's not just about your grades; we take the time to understand your personal circumstances and make decisions based on your potential to thrive at university and beyond.

Language Competency

As the programme is taught in English, **all applicants need GCSE Grade 4** (national Grade C) **or above in English** or the equivalent in other RQF Level 2 qualifications such as Key Skills.

International students require the equivalent of **IELTS 6.0 with no sub-test score lower than 5.5**, or will need to take a pre-sessional English course with the University.

Exceptionally, completing an undergraduate degree from a UK University within the last 2 years will exempt you from these English language requirements.

Academic Requirements

A typical profile of someone seeking entry to the MRes programme is holding an undergraduate degree (with Honours) in a scientific discipline, usually within chemistry, biology, pharmacy, biomedicine, or related fields, with at least an upper second classification (2:1) or equivalent.

Candidates who have not taken chemistry or chemical subjects in their undergraduate degree will also require a pass in A-Level Chemistry or an equivalent RQF Level 3 qualification.

For North American students a GPA of normally 2.5 and above (on a scale of 4.0), or an equivalent, is required. For other international students, visit:
https://www.bradford.ac.uk/international/country/
for details of accepted equivalent qualifications from your country.

Please note: These entry requirements are correct for the contemporary recruitment cycle. The current requirements are published on the course webpage: www.brad.ac.uk/courses/pg/master-by-research/

Access and Recognition of Prior Learning

Applications are welcome from candidates with relevant experience, including those with non-traditional qualifications, returners to study at any age, and holders of a 2:2 or equivalent undergraduate degree. These applications will be assessed on an individual basis and may include an interview.

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. Visit the RPL webpage for more information at: www.bradford.ac.uk/teaching-quality/prior-learning/

The University of Bradford has always welcomed applications from disabled students. To discuss adjustments or to find out more about support and access, you may wish to contact the Disability Service before you apply: www.bradford.ac.uk/disability/before/

Programme Learning Outcomes

To be eligible for a named FHEQ Level 7 award of **Postgraduate Certificate**, students will be able to:

1. Critically evaluate scientific literature and communicate scientific data.
2. Write and interpret scientific reports.
3. Critically evaluate and appraise experimental laboratory techniques.
4. Demonstrate an advanced knowledge of the key principles underpinning their specialist field.

5. Demonstrate critical analysis through ability to independently analyse, interpret, objectively evaluate and prioritise information and data, recognising its limitations.

6. Develop the autonomy in learning required for continuing professional development; apply skills in time-management, presentation, written communication and problem-solving.

Additionally, to be eligible for a named FHEQ Level 7 award of **Postgraduate Diploma**, students will be able to:

7. Safely plan, design and execute practical investigations, from the problem recognition stage through to the evaluation and critical appraisal of results and findings.

8. Demonstrate self-direction and originality in implementing a research project.

9. Demonstrate critical thinking through ability to independently recognise, define and prioritise problems and formulate solutions.

10. Effectively describe objectives and achievements of a research plan to different audiences e.g. scientific abstract, technical summary and lay statement.

11. Demonstrate initiative and personal responsibility in conducting research.

12. Make decisions in complex and unpredictable situations.

13. Work as part of a team to achieve a specific goal.

Additionally, to be eligible for a named FHEQ Level 7 **Degree award of Master by Research**, students will be able to:

14. Demonstrate a conceptual understanding of research and scientific method through ability to independently evaluate methodology critically, formulate conclusions based on complete and incomplete data and suggest further work.

15. Effectively communicate and interact with experts in their field in different formats, including poster and oral presentations and dissertation writing.

Curriculum

Postgraduate Certificate

Module Code	Module Title	Delivery Period	Core/ Option	Credits	FHEQ Level
INC7020-C	Principles of Drug Discovery	Sem 1	Option	30	7
INC7021-C	Toxicology & Safety Pharmacology	Sem 1	Option	30	7
INC7022-C	Research Skills for Postgraduate Students	Sem 1	Core	30	7

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

Postgraduate Diploma

Module Code	Module Title	Delivery Period	Core/ Option	Credits	FHEQ Level
LIS7020-E	MRes Project Part 1	Sem 2	Core	60	7

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

Degree of Master

Module Code	Module Title	Delivery Period	Core/ Option	Credits	FHEQ Level
LIS7021-E	MRes Project Part 2	Sem 3	Core	60	7

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

Learning and Teaching Strategy

A wide variety of teaching methods appropriate to the learning outcomes of the individual modules are employed throughout the programme, including:

- formal lectures from research/teaching staff
- lectures from visiting clinicians/scientist and industrial researchers
- small group workshops and discussions with peers
- laboratory practicals
- journal clubs
- group and one-to-one tutorials, and
- a large component of individual research.

These are supported by material provided on Canvas, the University's virtual learning environment. Students will also attend the Faculty Research Seminar programmes.

Self-directed independent learning forms a significant component at MRes level; students will be supported to develop the attributes and skills needed for life-long learning and continued professional development. Directed private study will involve students in a variety of activities, which include directed reading of selected textbooks and specified source literature, report writing (technical and lay), preparing presentations (oral and poster) to deliver to peers, and other assignments.

Representatives from the Library and from the Academic Skills Service attend the induction programme to introduce the range of support services available to students. Additional and bespoke lunchtime workshops are also available from the Academic Skills Service. All students are allocated a Personal Academic Tutor (PAT) to support their learning needs. Students with specific support needs are encouraged to identify themselves at the beginning of the course, when they meet with their PAT. PATs work closely with a dedicated Director

of Student Engagement and Success and the Disability Service to provide a bespoke learner support package for any student who needs it.

Some learning outcomes (LO) are more apparent in particular modules. For example, LO1 and LO2 are mainly developed in Critical Appraisal, whilst LO3 is mainly developed in Research Skills for Postgraduate Students. Acquisition of other learning outcomes (LO5, 6, 11 and 12) will occur gradually and cumulatively through a number of modules, employing a mix of lectures, laboratory investigations, coursework, workshops, individual project work and independent research guided by module tutors. Key skills for working as a research professional are embedded in the curriculum and some modules develop or consolidate and assess one or more of these key skills. The MRes Project will allow students to demonstrate all skills and knowledge developed through the year, and its completion demonstrates mastery of LO7-15.

Assessment Strategy

A range of assessment methods are used, supported by formative assessments to allow students to practise skills and knowledge before final summative assessment at the end of a module or course.

Written examinations and coursework are used to test LO4, whilst a range of different types of coursework are used to assess other LOs, including essays of varying length, journal club, worksheets, preparation of portfolios of reports on experimental work and assessment of students' laboratory, transferable skills and professionalism during the project period, poster and oral presentations.

The final MRes project is assessed by dissertation, *viva voce* examination and on professional performance to conducting research; these allow students to demonstrate achievement of all learning outcomes developed as part of the Postgraduate Certificate/Postgraduate Diploma taught programme and, more specifically, achievement of LO14-15, required for the MRes degree.

A more detailed description of the way that learning is related to assessment in the modules that make up this programme can be found in the module descriptors.

Assessment Regulations

This Programme conforms to the standard University Postgraduate Assessment Regulations available online at: www.bradford.ac.uk/regulations/