

MSc Materials Chemistry Programme Specification

Academic Year:	2023/24
Degree Awarding Body:	University of Bradford
Final and interim awards at Level 7 FHEQ (Framework for Higher Education Qualifications in England):	Master of Science in Materials Chemistry Postgraduate Diploma Postgraduate Certificate
Programme duration:	12 months full time
QAA Subject benchmark statement(s):	Chemistry (2014)
Date last confirmed and/or minor modification approved by Faculty Board	February 2023

Please note: This programme specification has been published in advance of the academic year to which it applies. 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.

Introduction

Materials chemistry is a major area of the chemical sciences where underlying scientific principles meet with real-world application. It is a fast moving and dynamic area of chemistry in which an initial laboratory discovery could turn out to be a world-changing product within a matter of a few years. The Materials Chemistry MSc is a research-focused degree. It is designed to deliver core teaching in advanced aspects of materials chemistry and also to allow students to explore areas of specialist knowledge through optional modules, and to then give them a genuine research experience through an extended research project.

The taught content of this programme is strongly research-led in line with university and faculty strategy, and academic staff who will teach on the programme are active researchers who publish in high-quality, international scientific journals.

The programme is designed to build from formal learning approaches to provide a good grounding in the topics, and to then progress to student-led study for individual or group projects. Teaching and learning methods will include lectures, seminars, tutorials, workshops, and the individual, substantial research project in a contemporary area of the field.

As well as developing key knowledge and skills specific to the topics, the programme will enhance autonomous learning and develop transferable skills and knowledge in areas such as scientific communication, critical review and analytical thinking, complex problem solving and reflective practice. Graduates from this programme will find their core and transferable

skills in demand from key industrial areas such as pharmaceuticals, polymers and the consumer health care industries, for example.

The aims and outcome statements have been referenced to the Quality Assurance Agency (QAA's) Subject Benchmark Statement for Chemistry (2014) and the UK Quality Code for Higher Education: the Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (2014) (FHEQ).

This should also ensure that the programme is aligned with European-wide guidance, particularly the Framework for Qualifications of the European Higher Education Area (QF-EHEA).

Programme Aims

The programme is intended to:

- Extend students comprehension of key chemical concepts and provide an in-depth understanding of Materials Chemistry.
- Provide a supportive educational environment.
- Enable students to become autonomous learners and equip them with the lifelong learning skills required to be adaptable over the course of their career.
- Develop competence in the design and execution of research and in the interpretation of scientific data.
- Develop and enhance students' ability in a range of personal and key transferable skills such as group work, presentation skills and report writing.
- Enhance skills associated with the communication of scientific data.
- Develop an understanding of the processes and challenges involved in taking research ideas into the marketplace.

Programme Learning Outcomes

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

1. Critically analyse the underlying science behind modern materials.
2. Critically evaluate recent advances in materials chemistry.
3. Construct arguments and present scientific ideas to their peers.
4. Design a research project plan.
5. Examine their level of attainment in defined attributes and skills through the use of reflective practice.
6. Work effectively within a multi-skilled team.

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

7. Devise solutions to unfamiliar types of problems through the adaptation of existing methodologies

- Critically examine and categorise an area of the scientific literature

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

- Implement an original and self-directed research project
- Critically evaluate and present the results of research
- Produce a dissertation and associated journal communication

Curriculum

The MSc in Materials Chemistry consists of 80 taught Credits (40 credits in Semester 1, and 40 credits in semester 2) and a substantial 100 credit individual research theme running through the whole MSc.

Postgraduate Certificate

Students will choose two from three optional modules in Semester 1:

FHEQ Level	Module Title	Module Type	Credits	Study Period	Module Code
7	Research Skills, Professional Development, and Commercial Awareness	core	20	1	CFS7025-B
7	Fundamentals of Nano and Supramolecular Materials	option	20	1	CFS7014-B
7	Colloids and Interfaces	option	20	1	CFS7036-B
7	Spectroscopy	option	20	1	CFS7030-B

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

Postgraduate Diploma

Students will choose two from three optional modules in Semester 2:

FHEQ Level	Module Title	Module Type	Credits	Study Period	Module Code
7	Research Project - Preparatory Investigations	core	20	2	CFS7022-B
7	Materials Characterisation	option	20	2	CFS7018-B
7	Introduction to Polymer Science	option	20	2	CFS6031-B
7	Materials in Electronics	option	20	2	CFS7024-B

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

Degree of Master

FHEQ Level	Module Title	Module Type	Credits	Study Period	Module Code
7	Research Project – Advanced Investigations	core	60	3	CFS7023-E

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

Learning and Teaching Strategy

The programme articulates with the University of Bradford Learning & Teaching Strategy. Students will be exposed to a variety of teaching methods designed to develop the learning outcomes and to cater for different preferences for learning. A wide variety of teaching methods appropriate to the learning outcomes of the individual modules is employed throughout the programme. The research-led focus of the Masters is reflected in the greater level of learner-autonomy in the second half of the programme.

LO1, LO2 and LO7 will be developed through lectures, seminars and workshops in Fundamentals of Nano and Supramolecular Materials, Introduction to Polymer Science, Materials in Electronics, Spectroscopy and Materials Characterisation. Directed study will include guided reading of selected textbooks, specified source literature, open learning materials, and directed Web-based materials.

LO4 and LO5 will be developed in Research Skills, Professional Development, and Commercial Awareness, where students will be introduced to the discipline of reflective practice and will develop skills for the management of project work.

The competencies required to achieve LO3 and LO6 will be introduced in Semester 1 as part of Research Skills and in Semester 2 in Fundamentals of Nano and Supramolecular Materials where students will work together to deliver a presentation. This will provide an opportunity for collaborative learning. These skills will be further developed in Semester 2 as part of the Research Project modules where students will be placed in a research group in which they will be expected to interact with and learn from their fellow group members in the pursuit of their research.

LO8 will be developed in the Research Project – Preparatory Investigations module where seminars will be used to develop the key skills required to critically engage with primary literature. LO9, LO10 and LO11 will be developed over the course of the Research Project – Advanced Investigations

Assessment Strategy

Students will demonstrate their achievement in LO1, LO2 and LO7 via written closed-book examinations using constructed (essays, short answers) questions and a variety of coursework assignments. All theory modules (the six optional modules) will have a summative examination but will differ in the coursework component. These include: A team poster presentation, worksheets, problem-based workshops, and group presentations.

LO3 and LO6 will be assessed through the delivery of presentations to the peer group - a group poster in Fundamentals of Nano and Supramolecular Materials and a group oral presentation in Research Project - Advanced Investigations. LO3 will be further assessed through a poster and oral presentation in the Research Project (Parts 1 and 2).

LO4 and LO5 will be assessed via the preparation of a personalised learning plan and a project plan in Research Skills, Professional Development, and Commercial Awareness. LO8, LO9 and LO10 will be assessed through the preparation of a dissertation, a journal publication and an oral presentation covering the research project.

Assessment Regulations

This Programme conforms to the standard University Postgraduate Assessment Regulations which are available at <https://www.bradford.ac.uk/regulations>

Admission Requirements

We take into consideration a number of factors when assessing your application. It is 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. 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 that candidates should hold a Bachelor's degree in Chemistry, Chemical Engineering, Materials Science, Biochemistry or other degrees with a significant element of core chemistry; at a minimum classification of a 2:1 (or equivalent). Applicants who have a 2:2 in a science subject with significant chemistry content will also be considered if they have relevant postgraduate work experience.

The minimum English language requirement is a GCSE grade C or 4, or IELTS 6.0 with a minimum score of 5.5 in each of the subtests, or the equivalent score in another recognised language test.

Recognition of Prior Learning

Applications are welcome from students with non-standard qualifications with significant relevant experience.

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

Version Number	Brief description of Modification	Date of Approval (Faculty Board)
1	CFS6015-B Introduction to Polymer & Colloid Science replaced by CFS6031-B Introduction to Polymer Science	January 2019
2	CFS7016-B Inorganic Materials Chemistry replaced by CFS7036-B Colloids and Interfaces	January 2020
3	CFS7030-B Spectroscopy added as a Sem 1 option, CFS7036-B Colloids and Interfaces removed for 1 year due to COVID mitigation	September 2020

4	Specification reformatted and made accessible.	November 2020
5	CFS7036-B Colloids and Interfaces added to semester 1	June 2021
6	CFS7024-B Material in Electronics changed from core to option	June 2021
7	CFS7018-B Materials Characterisation changed from core to option	June 2021
8	Annual changes for 2021 academic year	June 2021
9	Annual changes for 2022 academic year	March 2022
10	Annual changes for 2023 academic year	May 2023