UNIVERSITY of BRADFORD

Faculty of Life Sciences

Programme Specification

MSc Materials Chemistry

Academic Year:	2018/9
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 (FHEQ) level 7] **MSc in Materials Chemistry** **Postgraduate Diploma in Materials Chemistry** **Postgraduate Certificate in Materials Chemistry**
Programme accredited by (if appropriate):	Not applicable
Programme duration:	12 months full-time
QAA Subject benchmark statement(s):	Chemistry (December 2014)
Date of Senate Approval:	
Date last confirmed and/or minor modification approved by Faculty Board	July 2017

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-focussed degree. It is designed to deliver core teaching in advanced aspects of materials chemistry and to also 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:

A1 Extend students comprehension of key chemical concepts and provide an in-depth understanding of Materials Chemistry

A2 Provide a supportive educational environment

A3 Enable students to become autonomous learners and prepare them for the lifelong learning skills required to be adaptable over the course of their career

A4 Develop competence in the design and execution of research and in the interpretation of scientific data

A5 Develop and enhance students' ability in a range of personal and key transferable skills such as group work, presentation skills and report writing

A6 Enhance skills associated with the communication of scientific data

A7 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:

LO1 Critically analyse the underlying science behind modern materials

LO2 Critically evaluate recent advances in materials chemistry

LO3 Construct arguments and present scientific ideas to their peers

LO4 Design a research project plan

LO5 Examine their level of attainment in defined attributes and skills through the use of reflective practice

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

LO6 Work effectively within a multi-skilled team

LO7 Devise solutions to unfamiliar types of problems through the adaptation of existing methodologies

LO8 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:

LO9 Implement an original and self-directed research project

LO10 Critically evaluate and present the results of research

LO11 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 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. Students will choose two from three optional modules in semester 1.

FHEQ Level	Module Title	Type (Core/ Option/ Elective)	Credits	Semester	Module Code
7	Inorganic Materials Chemistry	option	20	1	CFS7016-B
7	Fundamentals of nano and supramolecular materials	option	20	1	CFS7014-B
6	Introduction to polymer and colloid science	option	20	1	CFS6015-B
7	Research skills, professional development, and commercial awareness	core	20	1	CFS7025-B

Postgraduate Diploma

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. Students will choose two from three optional modules in semester 2.

FHEQ Level	Module Title	Type (Core/ Option/ Elective)	Credits	Semester	Module Code
7	Computational Crystal Engineering	option	20	2	CFS7009-B
7	Materials in electronics	option	20	2	CFS7024-B
7	Materials Characterisation	option	20	2	CFS7018-B
7	Research Project – Preparatory Investigations	core	20	2	CFS7022-B

Degree of Master

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.

FHEQ Level	Module Title	Type (Core/ Option/ Elective)	Credits	Semester	Module Code
7	Research Project – Advanced Investigations	core	60	3	CFS7023-E

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 *Inorganic Materials Chemistry, Fundamentals of nano and supramolecular materials, Computational Crystal Engineering, Materials in electronics* and *Materials Characterisation*. Directed study will include directed 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 L06 will be introduced in Inorganic *Materials Chemistry* and *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 the *Research Project (Parts 1 and 2)* 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 – part 1* 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 (Parts 1 and 2)*

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 *Inorganic Materials Chemistry*. 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 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 the most important aspect 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:

- 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 2:2 (or equivalent).

- 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. If applicants do not meet the IELTS requirement, they can take a University of Bradford pre-sessional English course. See the Language Centre for more details.

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

Version Number	Brief description of Modification	Date of Approval (Faculty Board)
1		