

Programme Specification (PG)

Awarding body / institution:	Queen Mary University of London
Teaching institution:	Queen Mary University of London
Name of final award and programme title:	Master of Science Chemical Research
Name of interim award(s):	PG Cert/PG Dip
Duration of study / period of registration:	12 months (FT), 24 months (PT)
Queen Mary programme code(s):	F1U3, F1UP
QAA Benchmark Group:	Chemistry
FHEQ Level of Award:	Level 7
Programme accredited by:	
Date Programme Specification approved:	
Responsible School / Institute:	School of Physical and Chemical Sciences

Schools / Institutes which will also be involved in teaching part of the programme:

School of Engineering & Materials Science

Collaborative institution(s) / organisation(s) involved in delivering the programme:

Programme outline

This programme provides a comprehensive preparation for students wishing to progress onto a research career (bridging the gap between the lecture-dominated programme of a typical undergraduate BSc degree and the research intensive PhD degree), but the qualification can also be a real asset for those wishing to pursue other careers in industry, or in education. Training is given in a wide range of techniques to enable candidates to build up a substantial portfolio of experimental skills and thereby tackle more extended research and development projects with increased confidence. The practical work is also reinforced by lecture modules explaining the underlying theoretical basis of various research methods and techniques, and other aspects of advanced chemistry.

The major part of the programme is a research project on a topic agreed in consultation with the MSc programme coordinator. This practical work will generally provide training in a variety of specialised techniques appropriate to your chosen area of research and is carried out in the main research laboratories, under the supervision of a member of academic staff.

The taught component of the degree programme consists of two lecture modules, usually selected from the range of advanced undergraduate chemistry modules offered by the School.

Aims of the programme

The MSc in Chemical Research aims to introduce students to the field of chemical research by providing them with the opportunity to spend a year on a major research project, supplemented by lectures and seminars, leading to a recognised Master's qualification.

The programme aims to:

- provide a comprehensive preparation for students wishing to progress onto a research degree or into employment in a research-oriented environment, bridging the gap between the lecture-dominated programme of a typical undergraduate BSc degree and the research intensive PhD degree;
- provide a sound knowledge base in the fields studied and develop key transferable skills in the areas of communication, numeracy, information technology, working with others, problem solving, time and task management;

foster the development of an enquiring, open-minded and creative attitude, tempered with scientific discipline and social awareness, which encourages lifelong learning.

What will you be expected to achieve?

You will develop good scientific principles alongside independent and innovative thought. You will be expected to achieve an advanced, inter-disciplinary understanding of techniques and methodologies applicable to the field of chemical research and an appreciation of the current research industrial issues which are driving the science forward.

In particular, you should be able to demonstrate:

- skills in chemical research.
- the ability to synthesize information with critical awareness in a manner that may be innovative, utilising existing knowledge or cutting-edge, contemporary processes from the forefront of the discipline
- a level of conceptual understanding that will allow you critically to evaluate chemical research, advanced scholarship and methodologies, and to argue alternative approaches
- initiative and originality in problem solving, and be able to act autonomously in planning and implementing tasks at a professional or equivalent level

Academic Content:

A 1	Detailed knowledge and understanding of the essential facts, concepts, principles and theories in selected areas of advanced chemistry or closely-related fields, appropriate to the candidate's chosen area of specialisation
A 2	An appreciation of current research issues and approaches/techniques for investigating such matters across a wider range of chemistry
A 3	Use advanced theories and concepts to interpret data and explain chemical phenomena
A 4	Use a range of computational tools and packages for the analysis and presentation of data
A 5	Use a wide range of laboratory and analytical equipment, with appreciation of the nature of the measurement concerned and with due regard for optimisation of instrument use and performance

Disciplinary Skills - able to:

B 1	Awareness of the role and impact of science in society
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B 2	Prepare scientific/technical reports and a scientific presentation
B 3	Conduct advanced practical work efficiently and with due regard for safety and for the maintenance of an accurate and thorough laboratory record
B 4	Apply general chemical principles to the solution of advanced problems
B 5	Analyse and evaluate/interpret the results of experiments
B 6	Development and pursuit of a practical strategy for addressing the key goals of a research project, through application of chemical knowledge, understanding and creativity
B 7	Retrieve, filter and collate chemical data from a variety of information sources

Attributes:	
C 1	Communicate effectively by written and verbal means
C 2	Manage time, prioritise workloads and work to deadlines as a transferable key skill to help students with career goals and continuing education
C 3	Ability to work independently and capacity for independent learning in a new range of ways
C 4	Assess the relevance, importance and reliability of the ideas of others and successfully assess the quality of various information sources and use information constructively and critically
C 5	Ability to locate information and be competent in the use of information technology
C 6	Participate constructively as a member of a group/team, respect the opinions of others and act inclusively as responsible learners
C 7	Engage critically with knowledge through careful reasoning, synthesis of information and adaptation of understanding in new contexts
C 8	Identify information needs and devise strategies for the retrieval and selection of relevant information from a wide range of sources

How will you learn?

Students will be attending to two 15 credit modules from the list below. In addition, students will be completing a 150 credit extensive research project and give a research seminar. Students are also required to attend the School lecture series.

Progress in the research project is monitored by the project supervisor through regular meetings as well as the laboratory book and an interim report students need to submit. Students also need to submit dissertation drafts such as literature review and will receive feedback on this.

How will you be assessed?

Candidates will be independently assessed on five elements. These are:

A. Taught Courses

A.1 Advanced lecture course (level 7) 15 credits

A.2 Advanced lecture course (level 6 or level 7) 15 credits

B. Research Project MCHE700 value 150 credits

The following elements will be assessed

B.1 Research seminar.

B.2 Research project dissertation.

B.3 Research oral examination.

The pass mark for all elements is 50%.

Candidates shall normally be required to pass in all five elements of the examination to receive the award of the degree. Exceptionally, the examiners may condone a failure on one of the taught courses, provided a mark of at least 40% is achieved on this course and the weighted average mark (see below) over all elements is at least 50%.

The MSc in Chemical Research examination board may further recommend the award of:

- a Pass with Merit if the weighted average mark (see below) across all five elements exceeds 65%.

- a Pass with Distinction if the weighted average mark (see below) across all five elements exceeds 70%, provided the conditions specified in the General Regulations for Masters' Degrees are also met.

All such recommendations have to be approved by the Science & Engineering Postgraduate Examination Board (DEB).

The algorithm for calculating the overall average mark from the marks for the individual elements shall use the following weightings:

A.1 Advanced lecture course 8.3%

A.2 Advanced lecture course 8.3%

B.1 Research seminar. 8.4%

B.2 Research project dissertation. 42%

B.3 Research oral examination. 33%

The MSc degree is accorded 180 credits with 15 credits for each taught module and 150 credits for the major research project.

Resits

As outlined in the general regulations for non-modular MSc degree programmes, any candidate that fails one or more elements may resit those elements on one further occasion while being granted exemption from repeating elements which he/she has already passed. The timetabling of any re-assessment will be at the discretion of the School, but in no circumstances should this be more than 13 months after the initial failed attempt.

The MSc in Chemical Research Examination Board generally operates the following policies with regard to resits:

(i) The maximum mark that may be awarded for a resit is 50%.

(ii) Resits must be undertaken at the first opportunity; any candidate failing to register or turn-up for such a resit will be deemed to have failed and a mark of 0F recorded (unless there are appropriate extenuating circumstances).

A resit of the research project dissertation is generally understood to mean a resubmission of this dissertation. Only in exceptional circumstance will a candidate be permitted to complete further experimental work prior to resubmission, and in this instance a further tuition fee will be imposed.

Role of external examiners

External examiners are appointed by the MSc in Chemical Research Examination Board and are selected so as to provide a high level of expertise spanning all the main fields of the subject.

The roles of the external examiners include:

- reviewing examination papers and scripts;
- assessment of the research project dissertation;
- oral examination of the candidates;
- attending the final board of examiners meeting;
- providing feedback on the examining and assessment procedures.

How is the programme structured?

Please specify the structure of the programme diets for all variants of the programme (e.g. full-time, part-time - if applicable). The description should be sufficiently detailed to fully define the structure of the diet.

The programme is studied full-time over one calendar year, or part-time over two calendar years. Students are required to take two taught modules, attend relevant research seminars, and undertake a substantial research project in the chemical field under the direct supervision of a member of academic staff from the School.

The two taught modules include:

1. one M-level 7 course in an advanced chemical topic.
2. one additional advanced course (at level 6 or 7) usually in the chemical field, but exceptionally in a closely-related scientific field such as biochemistry, physics or materials science (with the agreement of the MSc programme coordinator)

At the end of the period allocated for completion of work on the research project component, students on this programme are required to:

1. submit a dissertation consisting of a comprehensive description and discussion of the work undertaken during the research project, together with a detailed literature review of the topic under investigation. This dissertation should not exceed a total of 30,000 words, and not more than half the dissertation should be review material.
2. present the results of their research at a seminar (30 min, including 5-10 min for questions).
3. submit themselves to an oral examination, based primarily on the material of the research project dissertation (this is normally conducted by one external examiner and one internal examiner).

Other requirements, such as attendance at research seminars and the production of interim reports, are detailed in the Programme Manual.

Academic Year of Study FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Organic Synthesis	CHE302P	15	6	Elective	1	Semester 1
Topics in Inorganic Chemistry	CHE303P	15	6	Elective	1	Semester 1
Topics in Physical Chemistry	CHE304P	15	6	Elective	1	Semester 1
Topics in Biological Chemistry	CHE309P	15	6	Elective	1	Semester 2
Advanced Topics in Chemistry	CHE410P	15	7	Elective	1	Semester 1
Bioorganic Chemistry	CHE307P	15	6	Elective	1	Semester 2
Chemical Research Project	CHE700P	150	7	Core	1	Semesters 1-3
Nanotechnology and Nanomedicine	EMS718U	15	7	Elective	1	Semester 1
Nanomaterials	CHE411P	15	7	Elective	1	Semester 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Advanced Analytical Chemistry & Spectroscopy	CHE308P	15	6	Elective	1	Semester 2
Fundamentals of Medicinal Chemistry	CHE706P	15	7	Elective	1	Semester 1
Molecular modelling for drug discovery	CHE705P	15	7	Elective	1	Semester 1
Scientific Programming for Drug Discovery	CHE709P	15	7	Elective	1	Semester 1
Machine and Deep Learning	SPC707P	30	7	Elective	1	Semesters 1 & 2
Professional Skills for Chemists	CHE310P	15	6	Elective	1	Semesters 1 & 2

What are the entry requirements?

Candidates must be able to satisfy the general admissions requirements of the University. This is usually achieved in one of the following ways:

1. A second class BSc degree in Chemistry or with Chemistry as a major component
2. An international qualification of similar standing to the above
3. A lower qualification supplemented by additional experience in the field (e.g. with experience of working in an industrial laboratory).

In addition, international (non-European) students must normally have an English language qualification at a level that meets the university guidelines for admission of international students (e.g. IELTS 6.5 or equivalent)

How will the quality of the programme be managed and enhanced? How do we listen to and act on your feedback?

The Student-Staff Liaison Committee (SSLC) provides a formal means of communication and discussion between the School and its students. The committee consists of student representatives from each programme and each year in the school, together with appropriate representation from staff within the school. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments. The Student-Staff Liaison Committee meet regularly throughout the year.

The School operates a Teaching and Learning Committee, chaired by the School's Director of Taught Programmes, which oversees and advises on all matters relating to the delivery of taught programmes at school level. This includes monitoring the application of relevant QM policies and reviewing all proposals for module and programme approval and amendment, before submission to Taught Programmes Board. Student views are incorporated in this Committee's work in a number of ways, such as through consideration of items referred by the SSLC and by consideration of student surveys, including module evaluation questionnaires.

All schools operate an Annual Programme Review of their taught undergraduate and postgraduate provision. Students' views are considered in this process through analysis of the results from the National Student Survey (NSS), module evaluations and other internal Queen Mary surveys.

What academic support is available?

Induction Programme, including briefing from the MSc in Chemical Research Tutor on matters relating to the requirements of the

Programme Title: MSc in Chemical Research

programme and conduct of research in the chemical laboratories a series of briefings, demonstrations and visits aimed at ensuring that students are aware of the range of facilities for the support of study and research in the School.

Personal research project supervisor: students on this programme have a research project supervisor who is a member of academic staff based in the School, and is the primary source of guidance on all matters relating to the research project component of the degree programme.

MSc in Chemical Research Tutor: who is available for consultation by students on this programme on any matter that relates to or impacts upon their studies. Access to teaching staff (on an individual basis, for matters relating to individual academic courses, or to deal with specific academic problems).

Queen Mary Student Guide (and a range of other on-line documentation, published by the College Registry)

MSc in Chemical Research programme manual (providing a range of information on both programme requirements and various aspects of departmental operations)

Extensive Library and IT facilities (incl . the main library, a subject librarian, the Student PC Service and the Computing Services Help Desk)

IT Training Short Courses (a range of short courses covering common software applications, operated by Computing Services)

On-line module documentation (including copies of lecture handouts, supplementary materials and model answers).

Computer-based self-learning modules (a range of PC applications and tutorial software, including selected links to relevant websites)

Support classes (mathematics) and drop-in sessions (chemistry, biology, physics and mathematics) operated by the Learning Development Unit (LDU)

English Language & Study Skills Programme (including pre-sessional and in-sessional classes in English language training for international students, and in-sessional Study Skills programme)

Staff-Student Liaison Committee(s): for discussion of, and feedback on, all matters relating to academic programmes and departmental teaching activities.

Other support services / development opportunities:

Advice & Counselling Service (for general advice, welfare information and counselling service)

College Residences Office (for support in finding accommodation)

Learning Support Service for Students with Disabilities/Learning Difficulties

Language Learning Unit (for introductory courses in various modern European languages)

Student Support Centre of the Queen Mary Student Union

Careers Service

Programme-specific rules and facts

Whereas regulation 5.67ii of the Academic Regulations states that for the award of MSc 150 credits need to be at level 7, the regulations for this programme requires at least 165 credits to be taken at level 7 and 15 credits at level 6.

Extract from the academic regulations:

PGDip in Chemical Research

Condoned failure

6.41 The examination board may condone failure in modules to a maximum value of 15 credits, where:

- i. a student achieves a module mark of 30.0 or higher; and,
- ii. the student achieves an average mark across all modules of 50.0 or higher.

MSc in Chemical Research

Timing of resits

6.42 The timetabling of reassessment shall be at the discretion of the SEB, but in no case shall this be more than 12 months after the initial failed attempt.

Condoned failure

6.43 The examination board may condone failure in modules to a maximum value of 15 credits, where:

- i. a student achieves a module mark of 40.0 or higher; and,
- ii. the student achieves an average mark across all modules of 50.0 or higher.

Classification of award

6.44 The MSc in Chemical Research shall be classified as follows:

College Mark Classification

70.0 – 100.0 Distinction

60.0 – 69.9 Merit

50.0 –59.9 Pass

Exit award

6.45 Where a student fails one of the taught modules, but passes the dissertation and the other taught module, the student may be considered for the award of PGDip Chemical Research.

How inclusive is the programme for all students, including those with disabilities?

Queen Mary has a central Disability and Dyslexia Service (DDS) that offers support for all students with disabilities, specific learning difficulties and mental health issues. The DDS supports all Queen Mary students: full-time, part-time, undergraduate, postgraduate, UK and international at all campuses and all sites.

Students can access advice, guidance and support in the following areas:

- Finding out if you have a specific learning difficulty like dyslexia
- Applying for funding through the Disabled Students' Allowance (DSA)
- Arranging DSA assessments of need
- Special arrangements in examinations
- Accessing loaned equipment (e.g. digital recorders)
- Specialist one-to-one "study skills" tuition
- Ensuring access to course materials in alternative formats (e.g. Braille)
- Providing educational support workers (e.g. note-takers, readers, library assistants)
- Mentoring support for students with mental health issues and conditions on the autistic spectrum.

Links with employers, placement opportunities and transferable skills

This programme provides a comprehensive preparation for students wishing to progress onto a research degree, bridging the gap between the lecture-dominated programme of a typical undergraduate BSc degree and the research intensive PhD degree. Graduates often proceed on to a PhD programme, although the MSc qualification can also be a real asset for careers in teaching or industry.

Graduates of chemistry degree courses are generally recognised by employers as having good technical and transferable skills: including skills in literacy, numeracy, application of logic, problem solving, communication, IT and computation, independent and team working, and time management.

Opportunities for employment within the field of chemistry would include careers in the following areas: chemical industry; pharmaceuticals; food industry; mining, oil and gas industries; consumer products (e.g. cosmetics); analytical and forensic services; teaching and education; environmental protection.

Opportunities for employment outside the field of chemistry would include careers in the following areas: finance; commerce; civil service; law; journalism; publishing; healthcare; technical sales; information technology.

Programme Specification Approval

Person completing Programme Specification:

Rachel Crespo Otero

Person responsible for management of programme:

Rachel Crespo Otero

Date Programme Specification produced / amended by School / Institute Learning and Teaching Committee:

8 Dec 2023

Date Programme Specification approved by Taught Programmes Board: