Programme Title: MSc in Materials Research

Programme Specification

Awarding Body/Institution	Queen Mary, University of London
Teaching Institution	Queen Mary, University of London
Name of Final Award and Programme Title	MSc Materials Research
Name of Interim Award(s)	PG Certificate / PG Diploma
Duration of Study / Period of Registration	1 calendar year
QM Programme Code / UCAS Code(s)	J5R3
QAA Benchmark Group	Masters degrees
FHEQ Level of Award	Level 7
Programme Accredited by	Institute of Materials, Minerals and Mining, on behalf of the Engineering Council.
Date Programme Specification Approved	1 Jan 2009
Responsible School / Institute	School of Engineering & Materials Science

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

Institution(s) other than Queen Mary that will provide some teaching for the programme

Programme Outline

The MSc offers high quality postgraduate training in methods and practice of research including relevant transferable skills that are not normally offered in conventional taught MSc courses. The MSc degree serves both as a qualification in its own right for entry to a research career in industry or as an enhanced route to a PhD through further research. The programme provides an insight into areas of manufacturing, planning and control systems, knowledge based systems and measurements and manufacturing systems. It is interdisciplinary in nature and involves a combination of theoretical and practical approaches. Taught modules concentrate on advanced Materials topics and the research project provides an intellectual and practical challenge and thus enables the student to demonstrate creativity and initiative and, where appropriate, forms a foundation for doctoral study.
There is scope within the programme to study optional modules and to prescribe additional modules that can be matched to gaps in a given student's background. For example, students without a qualification in Materials, Minerals and Mining will be asked to select Materials rich modules such as Materials Selection and Design, Ceramics or Environmental Properties of Materials in semester A and Advanced Polymer Synthesis, Composites or Failure of Solids in semester B.

Aims of the Programme

The overall aims of the programme are:

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• to provide a materials education of a standard recognised to be amongst the highest in UK institutions
• to take a multi-disciplinary approach to the elements of materials science and engineering, including design
• to educate our students in the scientific and mathematical principles underpinning materials science
• to enable all our students to achieve their academic potential by providing a stimulating, friendly and supportive environment
• to offer challenging programmes which provide our graduates with a clear pathway to Chartered Engineering status
• to prepare our graduates with discipline-specific knowledge and transferable skills that will equip them for employment and continued professional development through self-learning.

Specific aims include:
• analytical, creative, organisational, practical and communication skills,
• problem-recognition and solving abilities
• competence in discipline-specific topics which contribute to the solution of problems applied to materials science
• an appreciation of how theoretical and practical approaches can be synthesized to arrive at optimal solutions
• an appreciation of the financial context of the development of new materials and products
• an understanding of the relationship between their discipline and social, economic and environmental issues and constraints
• an appreciation of the relative merits of a proposed solution,
• the detailed skills needed to undertake a research, development or design project in depth, understanding the technical, financial and time limitations.

This programme aspires to produce the type of highly skilled, motivated, creative and team-work oriented graduates which the related industry needs.

What Will You Be Expected to Achieve?

Acquire contemporary factual knowledge in the area of Materials Research incorporating fundamental principles of Materials Science and Engineering and develop the ability to apply this knowledge in cutting edge research in Materials Science in a multidisciplinary context.

Academic Content:	
A 1	Have acquired a body of contemporary factual knowledge incorporating the fundamentals of Materials Science and, as appropriate, recognise the application of this to Materials Science
A 2	Have acquired sufficient knowledge of fundamentals of Materials Science principles as applied to realistic materials applications
A 3	Have an understanding of the fundamental physical concepts of core technologies so that the limitation of the experimental, mathematical and computational techniques available are fully recognised
A 4	Have acquired an understanding of the multidisciplinary nature of modern Materials Science and the diversity of research areas that Materials Science has an impact on.

Disciplinary Skills - able to:	
B 1	Demonstrate sufficient fundamental scientific and engineering principles to be able to work with materials science related problems and projects
B 2	Appreciate the wider multidisciplinary scientific and engineering context of Materials Research and its underlying principles
B 3	Appreciate the social, environmental, ethical economic and commercial considerations affecting their engineering judgement
B 4	The ability to carry out research in a multidisciplinary environment and to collaborate effectively with scientists and engineers from diverse backgrounds.

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Attributes:	
C1	Have the ability to analyse and solve problems individually and in groups
C2	Have the ability to communicate knowledge and ideas verbally and in written reports
C3	Apply scientific principles to a range of materials related applications
C4	Understand both the application and limitation of mathematical, computational and experimental techniques available to an engineer
C5	Have the ability to acquire a working knowledge of new experimental and/or computational techniques used in Materials Research within a short space of time.

How Will You Learn?

Through a wide range of different interactions including lectures, tutorials, laboratory classes, exercise classes and project supervisions. It is expected that the programme will demand between 1800 and 2000 hours in total to complete. About 10% of this time will be in scheduled lectures. A significant amount of independent personal study is anticipated as part of this degree.

How Will You Be Assessed?

The taught modules will be assessed through both coursework and examinations. The details are as outlined in the individual module specifications. The examinations will take place in the standard college examination periods in January and May for taught modules taken in SEMS. The final project thesis will be assessed in September and the student will also complete a presentation as well as an oral examination.

How is the Programme Structured?

The Materials Research MSc is a 12 months programme at QMUL accredited by the Institute of Materials, Minerals and Mining, which allows students to progress to chartered engineer status (CEng). In semesters A and B you will study 3 compulsory and 5 optional modules. The compulsory modules include two advanced materials modules covering the areas of nanomaterials and modern materials characterization techniques and a module on research methods, which is designed to give you a range of transferable skills such as thesis writing and critical analysis of the literature. The optional modules cover a wide range of contemporary topics in Materials Research providing you with the opportunity to tailor the programme to your individual needs and interests. The research project will run through all three semesters. You will become a member of one of the research groups in our School and work on your project alongside the PhD students and postdoctoral researchers in your group.

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Academic Year of Study 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Advanced Structure-Property Relationships in Materials	MTRM065	15	7	Compulsory	1	Semester 1
Research Methods and Experimental Techniques in Engineering	DENM014	15	7	Compulsory	1	Semester 1
Environmental Properties of Materials	MTRM040	15	7	Elective	1	Semester 1
Polymer Physics	MTRM798	15	7	Elective	1	Semester 1
Ceramics	MTRM068	15	7	Elective	1	Semester 1
Materials Selection and Design	MTRM011	15	7	Elective	1	Semester 1
Nanotechnology and Nanomedicine	MTRM803	15	7	Elective	1	Semester 1
Introduction to Law for Science and Engineering	IPLM701P	15	7	Elective	1	Semester 1
Advanced Materials Characterization Techniques	MTRM066	15	7	Compulsory	1	Semester 2
Failure of Solids	MTRM025	15	7	Elective	1	Semester 2
Chemical and Biological Sensors	MTRM069	15	7	Elective	1	Semester 2
Advanced Polymer Synthesis	MTRM797	15	7	Elective	1	Semester 2
Composites	MTRM730	15	7	Elective	1	Semester 2
Manufacturing Processes	MTRM713	15	7	Elective	1	Semester 2
Foundations of Intellectual Property Law and Management	IPLM702P	15	7	Elective	1	Semester 2
Research Project	MTRM005	60	7	Core	1	Semester 3

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What Are the Entry Requirements?

Students will be admitted typically with:

A first degree in an appropriate area with at least a good 2:2 qualification.

How Do We Listen and Act on Your Feedback?

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

Each school/institute operates a Learning and Teaching Committee, or equivalent, which advises the School/Institute Director of Taught Programmes on all matters relating to the delivery of taught programmes at school level including 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 the committee's work in a number of ways, such as through student membership, or consideration of student surveys.

All schools/institutes operate an Annual Programme Review of their taught undergraduate and postgraduate provision. APR is a continuous process of reflection and action planning which is owned by those responsible for programme delivery; the main document of reference for this process is the Taught Programmes Action Plan (TPAP) which is the summary of the school/institute's work throughout the year to monitor academic standards and to improve the student experience. Students' views are considered in this process through analysis of the NSS and module evaluations.

Academic Support

During induction the students will be welcomed to the college by the programme organisers Early on in the programme the students will select a project supervisor based upon a wide choice of different project areas. This academic will then also act as a personal tutor. Many of the modules are taught to small classes and so a high level of personal support will also be available from the course coordinators in the majority of the taught modules.

Programme-specific Rules and Facts

The programme follows the standard QMUL guidelines for MSc delivery.

Specific Support for Disabled Students

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

The school has an active Industrial Liaison forum (ILF). This forum has a direct impact on the programmes by encouraging employers to sponsor and support the students and to provide real design case studies to engage the students throughout the curriculum. Recent case studies that have been taught and assessed were delivered by Bridgestone, DuPuy, Apatech, Artis, Corus, BAe, DSTL, Rolls Royce.

The ILF meets twice a year. The event in October runs in parallel with the SEMS prize day where companies such as Cookson, Apatech, Rolls Royce, Corus, DuPuy award prizes to more than 30 of our best students. Also during the October event the projects that students will tackle in the academic year are planned and the second event in March is designed to help evaluate and review the projects. The School is always looking at extending membership of the ILF.

Programme Specification Approval

Person completing Programme Specification	Steffi Krause
Person responsible for management of programme	Steffi Krause
Date Programme Specification produced/amended by School Learning and Teaching Committee	
Date Programme Specification approved by Taught Programmes Board	1 Jan 2009

Queen Mary University of London