

Programme Specification

Awarding Body/Institution	Queen Mary University of London
Teaching Institution	Queen Mary University of London
Name of Final Award and Programme Title	Bachelor of Engineering (BEng) Materials and Design
Name of Interim Award(s)	
Duration of Study / Period of Registration	3 years (plus optional year in industry)
QM Programme Code / UCAS Code(s)	J590, J591
QAA Benchmark Group	Materials
FHEQ Level of Award	Level 6
Programme Accredited by	New Programme in 2013
Date Programme Specification Approved	
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

This is a new programme offering an UG learning opportunity, which is unique across the nation. It is geared to students who want to develop creativity and innovation without compromising on acquiring solid scientific foundations. This is achieved by a combination of core materials modules (75%) and a selection of tailored modules (25%), mostly based on practical design projects, allowing to learn from doing, under the guidance of experienced practising designers.

Aims of the Programme

The overall aims of the programme are:

- to provide a modern materials education, to the highest recognised national standards, enriched with aspects of design and innovation

- to take a multi-disciplinary approach to the elements of materials science, engineering and design.
- to educate our students in the scientific principles underpinning materials science to stimulate a culture of creativity and innovation, built up on a solid scientific and technological knowledge and applied to “real world” problems.
- 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.

What Will You Be Expected to Achieve?

By the end of this programme of studies you are expected to develop into the type of creative, self-driven, highly skilled, and team-work oriented graduate which will be attractive for many industry needs.

Academic Content:	
A 1	have acquired a body of contemporary factual knowledge incorporating the fundamentals of Materials Science
A 2	have acquired sufficient knowledge of designing and design process in multi-disciplinary design projects
A 3	have acquired sufficient knowledge of fundamentals of Materials Science principles as applied to realistic materials applications and design
A 4	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

Disciplinary Skills - able to:	
B 1	Demonstrate sufficient fundamental scientific and engineering principles as well as design principles to be able to work with materials science and engineering related problems and projects
B 2	Appreciate the wider multidisciplinary scientific and engineering context and its underlying principles
B 3	understand the relationship between their discipline and social, economic and environmental issues and constraints, particularly in relation to the development of new materials and products
B 4	Appreciate the social, environmental, ethical, economic and commercial considerations affecting their engineering judgement
B 5	Be able to select appropriate materials and manufacturing processes

Attributes:	
C 1	be creative and innovative within a scientific context
C 2	problem-recognition and solving abilities
C 3	show organisational, practical and communication skills
C 4	Be able to carry out a substantial piece of individual work whose structure and content is largely self-determined

C5	Be able to work co-operatively within a team
C6	Be able to manage their time efficiently

QMUL Model Learning Outcomes - Level 4:	
D1	Identify and discuss their own career aspirations or enterprise skills and knowledge and how they impact on others
D2	Identify and discuss what their own role in their programme and/or subject discipline might mean to them for future careers
D3	Identify and demonstrate the perspectives or problem solving techniques of different disciplines
D4	Demonstrate connections between different theoretical perspectives within your discipline

How Will You Learn?

The programme is delivered through a combination of lectures, studio sessions, problem solving classes, laboratory practicals, and courseworks. Student centered learning and design studios, play a major role, particularly in the your first and second years.

All the design studios are based on practical design projects. You will learn designing from the experience of doing the design projects with tutorials provided by experienced practising designers. In the design modules students work both on individual and group projects.

You will undertake a major individual research project in the third year, designed to assimilate and utilise knowledge gained throughout the degree towards approaching a real materials design problem. The 3rd year project allows you to participate in the specialist internationally-recognised research taking place within the School of Engineering and Materials Science.

How Will You Be Assessed?

Assessment is continuous throughout the degree, with written reports, projects, presentations, group work and exams (exams take place in the summer only). The degree programme has eight modules per year split over two semesters. Half of the first and second year will be practical based only. The rest is assessed by a combination of courseworks and end of year exams.

How is the Programme Structured?

Please specify the full time and part time programme diets (if appropriate).

The programme has a modular structure with a total of eight modules being studied in each year. There is a core of six modules (75%) per year shared among all Materials streams. The differentiation between the programmes is determined from the stream specific modules; typically this is two modules (25%) per year. The core modules have been designed to ensure that all the key aspects of materials science are delivered to all our students. The stream specific modules are designed to provide insight into specific sectors. In the case of Materials and Design the stream specific modules are: Design Studio (30 credits), Studio Practice (30 credits) and Management of Design (15 credits).

We also offer a BEng degree 'with Industrial Experience' where you would take a year working in a Aerospace Engineering related industrial position either after your second or third years of study. If you are not registered on a 'with Industrial Experience' programme you can opt into it at any stage prior to taking your placement. You would extend your studies by a year as you undertake a structured programme at one of our many partner companies. To support this activity we employ a full time Industrial Placement Manager in the School, who supports you through the application process and then manages the programme whilst you are on the placement.

QMUL Model

Students are required to undertake the equivalent of one module (15 credits in 2017/18) per year of study which has been identified as meeting the requirements of the QMUL Model. Each of these modules has been designed to combine the best of QMUL's academic excellence with your ability to identify and develop your skills, networks and experience. This will help to ensure you become a graduate who can undertake further study or secure graduate employment in areas that interest you, and will support your ability to position yourself to find the right job or opportunity for you. The relevant module for your first year of study in 2017/18 is indicated below.

Where more than one module is specified, this is because pertinent elements from these modules have been identified as being appropriate to the QMUL Model and when studied together, deliver the equivalent content of one 15-credit QMUL Model module.

The QMUL Model modules for future years and associated Learning Outcomes will be identified as your studies continue.

Should Professional, Statutory and Regulatory Body requirements apply to your programme of study, these will be taken into account in the specification of QMUL Model requirements.

Academic Year of Study FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Materials Science 1: Properties of Matter	MAT100	15	4	Compulsory	1	Semester 1	<input type="checkbox"/> No
Materials Selection and Mechanical Modelling	MAT102	15	4	Compulsory	1	Semester 1	<input type="checkbox"/> No
Design Studio	DEN126	30	4	Compulsory	1	Semesters 1 & 2	<input type="checkbox"/> No
Student Centred Learning 1	MAT106	30	4	Core	1	Semesters 1 & 2	<input type="checkbox"/> Yes
Mathematics for Materials Scientists	MAT115	15	4	Compulsory	1	Semester 2	<input type="checkbox"/> No
Materials Science 2: Processing and Applications	MAT206	15	4	Compulsory	1	Semester 2	<input type="checkbox"/> No

Programme Title: BEng Materials and Design, BEng Materials and Design with Industrial Experience

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Transferable Skills for Engineers and Materials Scientists	MAT4444	0	4	Compulsory	1	Semesters 1 & 2	<input type="checkbox"/> No

Academic Year of Study FT - Year 2

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Design for Manufacture	DEN5101	15	5	Compulsory	2	Semester 1	<input type="checkbox"/> No
Polymers	MAT313	15	5	Compulsory	2	Semester 1	<input type="checkbox"/> No
Student Centred Learning 2	MAT308	30	5	Core	2	Semesters 1 & 2	<input type="checkbox"/> Yes
Studio Practice Course Year 2	DEN212	30	5	Compulsory	2	Semesters 1 & 2	<input type="checkbox"/> No
Metals	MAT321	15	5	Compulsory	2	Semester 2	<input type="checkbox"/> No
Structural Characterisation	MAT400	15	5	Compulsory	2	Semester 2	<input type="checkbox"/> No

Academic Year of Study FT - Year 3

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Final Year Undergraduate Research Project	MAT500	30	6	Compulsory	3	Semesters 1 & 2	<input type="checkbox"/> No
Materials Selection and Design	MAT602	15	6	Compulsory	3	Semester 1	<input type="checkbox"/> No
Ceramics	MAT522	15	6	Compulsory	3	Semester 1	<input type="checkbox"/> No
Environmental Properties of Materials	MAT507	15	6	Compulsory	3	Semester 1	<input type="checkbox"/> No
Manufacturing processes	MAT601	15	6	Compulsory	3	Semester 2	<input type="checkbox"/> No

Programme Title: BEng Materials and Design, BEng Materials and Design with Industrial Experience

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Failure of Solids	MAT501	15	6	Compulsory	3	Semester 2	No
Renewable Energy Materials	MAT427	15	6	Compulsory	3	Semester 2	No

What Are the Entry Requirements?

Students will be admitted typically with:

A Levels

BEng: 2 Bs and 1 C at A level including at least two sciences and, preferably, one creative subject.

HE Diploma

Grade B

Students must also have a Maths A Level with at least grade B

BTEC National Diploma

DDD (three Distinctions)

Students must also have a Maths A Level with at least grade B

The International Baccalaureate

28 points overall including two sciences at higher level 6

Access and Foundation degrees

Considered on a case by case basis.

How Do We Listen and Act on Your Feedback?

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

The chair of the SSLC sits on the School's Education and Learning Committee, which advises the School's Director of Taught Programmes on all matters relating to the delivery of taught programmes at School level, and ensures that student feedback is fed into the reviewing of modules and programmes. Student views are also incorporated in the Committee's work in other ways, such as through the National Student Survey (NSS), student module evaluations and module forums. We also use the forums to listen to student feedback on an individual module basis and develop materials and support classes to address comments or requests suggested in the forum.

All Schools operate an Annual Programme Review (APR) 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's work throughout the year to monitor academic standards and to improve the student experience.

Academic Support

Academic support for the programme as a whole, including choosing optional modules and possible transfer between programmes is provided in the first instance by the Personal Tutor, with further guidance available from the Senior Tutor and Programme Director, the latter having overall responsibility for the programme structure. The Programme Director in turn

Programme Title: BEng Materials and Design, BEng Materials and Design with Industrial Experience

reports to the relevant Discipline Teaching Group in the School, the Chair of which is a member of the School's Education and Learning Committee.

Academic support for individual modules is the responsibility of the module organiser and co-organiser(s). These are supported by Teaching Assistants and post-graduate students, many of whom will have studied the modules themselves as undergraduates in the School. In addition there is technician support available for practical sessions.

We additionally have a School Office, with many student facing staff available to support student learning and one full time Student Support Officer. These staff members will help with coursework submission, time tabling concerns and other general administration as well as providing pastoral support and further guidance on dealing with extenuating circumstances. We also have staff designated to support students in achieving industrial placements and providing careers advice.

Programme-specific Rules and Facts

The Programme operates under the standard QMUL rules for MEng programmes. Students on the "with Industrial Experience" version need a year 1 average of at least 55% to progress to year 2 of the programme. Failure to achieve this will result in a transfer to the version without Industrial Experience.

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

We place a strong emphasis on supporting our students in achieving quality graduate positions at the end of their degrees. In the first year, all students take a transferable skills module, designed to both support them through the transition to university life, and also introduce the important employability skills they will need in later life. We run an extensive range of employability training events, with weekly timetabled careers slots and field trip visits to more than 20 collaborating companies. Our relationships with both the Careers Group and Student Services are strong in SEMS, and we co-deliver our training in study skills and career development for maximum benefit.

Since 2011 we have had a placement officer working in the school dedicated to supporting our new "with Industrial Experience" programmes which have grown immensely in popularity in the last few years.

The School has run Industrial Liaison Forums (ILFs) each academic year since the School was formed in 2007. Since 2010, the Autumn event is focused on encouraging more industrial participation in our research programmes, rewarding excellence by allowing companies to present student prizes for academic excellence across the School and also as a way of allowing companies and our students to interact through themed panel sessions and a careers fair. The Spring event aims to showcase our best third year project students and all of our group MEng projects. This event again allows extensive networking opportunities between employers and placement providers with all of our students in SEMS. Typically these events are attended by over 50 companies including our regular student prizes sponsors: Tata Steel, Eaton Industries, JRI, GSK, RollsRoyce, Apatech, Morgan Crucible, ARTIS,

Programme Title: BEng Materials and Design, BEng Materials and Design with Industrial Experience

NPL, TWI, Becker Coatings; Advanced Healthcare Ltd & Apatech. Many of these companies are also actively engaged in student projects and in addition to these our events are also attended by additional companies that also collaborate with projects such as: Jaguar Land Rover, Alcoa, Perryman, DSTL, BAe, Airbus, Corin, DePuy, Baxter's Healthcare, Norman Foster Partners and many others. In recent times we have extended these events to encourage participation from our more recent alumni as well.

These forums have a direct impact by encouraging employers to sponsor and support the student projects and to provide real engineering case studies to engage the students throughout the curriculum. Many of these companies also support our lecture programme in individual modules. Recent case studies that have been taught and assessed were delivered by companies including Tata, Gillette, Sugru, JRI, DuPuy, Apatech, Artis, BAe, DSTL, Rolls Royce, Perryman and Advanced Healthcare Ltd.

Programme Specification Approval

Person completing Programme Specification

Dr Emiliano Bilotti/ Dr Henri Huijberts

Person responsible for management of programme

Dr Emiliano Bilotti

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

1 Nov 2016

Date Programme Specification approved by Taught Programmes Board