

Programme Specification

Awarding Body/Institution	Queen Mary University of London
Teaching Institution	Queen Mary University of London
Name of Final Award and Programme Title	MEng(Hons) Design, Innovation and Creative Engineering (with year abroad)
Name of Interim Award(s)	
Duration of Study / Period of Registration	4 years
QM Programme Code / UCAS Code(s)	4L71 (4L7Y)
QAA Benchmark Group	Engineering
FHEQ Level of Award	Level 7
Programme Accredited by	n/a
Date Programme Specification Approved	
Responsible School / Institute	School of Engineering & Materials Science

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

School of Electronic Engineering & Computer Science

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

Programme Outline

Traditionally Design and Engineering programmes have been either Arts or Engineering based. It is becoming increasingly apparent that in future design graduates will need to be both artist and scientist, or at least, be able to understand how they may cross the divide. In the future there will be a growing need for designers who are educated as both engineering professionals (who can understand and can apply the latest technological developments), and designers (who understand creative processes, and are able to research and address questions of the contextual relevance and the appropriateness of design).

In the MEng Design, Innovation and Creative Engineering programme, design creativity and knowledge of technology are an integral part of the structure.

The programme aims to provide a strong interaction between creativity and human factor design together with practical technology through engineering, materials and process principles, and multimedia technology, enabling the students to obtain unique interdisciplinary skills to evaluate design problems.

The programme combines a balanced diet of design and creative engineering course study work together with a third essential

element, an integrated practical studio and workshop application of those studies.

The programme develops knowledge of fundamental creative engineering and design principles to enable graduates to become a design practitioner. The core design studio sessions will encourage multidisciplinary and interdisciplinary design processes, deepening development of intellectual competence and project management skills. These sessions will also develop analytical skills, creative potential, and appreciation of management.

To become the developer of a successful innovative product, students will learn, in the context of design development, about technology, materials and the methods of manufacture. They will also gain some appreciation of what is the best strategy to bring the product to market.

In year 4 students will undertake a major individual Design project of 60 credits, which will give students experience of product development from inception to realisation. As every new project will necessitate the acquisition of new technical knowledge, students will also study 60 credits worth of Engineering and Materials modules that provide background knowledge for the Design project at hand.

Aims of the Programme

The overall aims of the programme are:

- to provide a combined Design and Creative Engineering education of a standard recognised to be among the highest in UK institutions;
- to take a multi-disciplinary approach to the elements of Design and Creative Engineering;
- to educate students in the scientific and mathematical principles underpinning Engineering;
- to enable all students to achieve their academic potential by providing a stimulating, friendly and supportive environment;
- to prepare graduates with discipline-specific knowledge and transferable skills that will equip them for employment and continued professional development through self-learning.

Specific aims include:

- development of students' creativity and analytical skills;
- equip students with technical and professional skills in Design and Engineering practice;
- teach students to apply fundamental Engineering and Design principles in their Design practice;
- encourage students to consider and contextualise Design in broad philosophical, economic and socio-cultural contexts, so that they may develop designs informed by these contexts, and be aware of and responsible for the effect their designs will have in these spheres;
- support and promote multidisciplinary and interdisciplinary practices in and beyond Design and Engineering;
- encourage and promote practical and written work that is innovative, thoughtful, responsible, and well considered;
- develop the detailed skills needed to undertake a research/development/design project in depth, understanding the technical, financial and time limitations.

What Will You Be Expected to Achieve?

Academic Content:

A1	knowledge of fundamental principles of Engineering across a range of traditional delineations of the subject.
A2	knowledge of fundamental Design principles and application of multimedia technology in Design practice.
A3	understanding of Design and Engineering practice in socio-cultural, economic and political contexts.

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A4	knowledge of the ethical and commercial aspects of Design and Engineering practice.
A5	detailed knowledge of project management techniques.

Disciplinary Skills - able to:	
B1	use Engineering know-how to inform and strengthen Design practice;
B2	understand both the application and limitation of mathematical, computational and experimental techniques available to an Engineer;
B3	source individual creative endeavours and to find and use appropriate resources (human and material) in the realisation and communication of ideas;
B4	evolve individual methods and strategies, and draw on methods and strategies deployed by others, to create meaningful designs;
B5	investigate and apply human factors in Design and Engineering to evolve a user centred approach to Design;
B6	gain a working knowledge of various technical tools as an aid in the development, realisation and presentation of Design ideas.
B7	undertake a research/development/design project in depth, understanding the technical, financial and time limitations;

Attributes:	
C1	be able to manage time efficiently
C2	be able to work co-operatively within a team;
C3	possess general study skills;
C4	recognise the responsibilities of the professional Designer and Engineer;
C5	have the ability to communicate knowledge and ideas verbally and in written reports;
C6	have enthusiasm and a spirit of enquiry for continued learning throughout their careers.
C7	be able to carry out a substantial piece of individual work whose structure and content is largely self-determined.

QMUL Model Learning Outcomes - Level 4:	
D1	Identify and discuss what their own role in their programme and/or subject discipline might mean to them for future
D2	Identify and demonstrate the perspectives or problem solving techniques of different disciplines

D3	Discuss socio-cultural values and practices with others
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How Will You Learn?

A wide range of teaching, learning and assessment techniques are adopted. Teaching methods are tailor-made to suit the size of classes, the nature of the subject and the level of study. Each module has a mix of lectures, tutorials, laboratory sessions, industrial visits, workshops, group work, etc. Many of these techniques are combined during design studio practice.

The individual projects are designed for students to exercise independent thinking, research and problem solving skills. The group projects enhance students' communication, organisational as well as technical skills.

How Will You Be Assessed?

Assessment strategies vary from one module to another, these are described in detail on the SEMS and EECS websites for each module.

The assessment operates in accordance with established College procedures.

How is the Programme Structured?

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

Whilst at University, you gain a solid foundation in Engineering by studying core Engineering modules such as Mathematics, Solid Mechanics, Engineering Instrumentation, Aerospace Composites and Materials Selection. You will further study multimedia modules and modules that allow you to develop an awareness of the context in which professional Creative Design Engineers work. The Studio Practice modules DEN126, DEN212, DEN327, DEN329, DEN419 form the spine of the whole programme and as a consequence you need to pass these to be awarded your degree.

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

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Arts Application Programming	ECS405U	15	4	Compulsory	1	Semester 1	<input type="checkbox"/> No
Engineering Design Methods	MAT4002	15	4	Compulsory	1	Semester 1	<input type="checkbox"/> Yes
Studio Practice Year 1	DEN126	30	4	Core	1	Semesters 1 & 2	<input type="checkbox"/> Yes
Bridging Arts & Technology	ECS406U	15	4	Compulsory	1	Semester 1	<input type="checkbox"/> No
Mathematics for Materials Scientists	MAT115	15	4	Compulsory	1	Semester 2	<input type="checkbox"/> No
Engineering Mechanics: Statics	DEN4102	15	4	Compulsory	1	Semester 2	<input type="checkbox"/> No
Introduction to Multimedia	ECS416U	15	4	Compulsory	1	Semester 2	<input type="checkbox"/> No
Engineering Instrumentation	DEN5109	15	5	Compulsory	2	Semester 1	<input type="checkbox"/> No
Creating Interactive Objects	ECS511U	15	5	Compulsory	2	Semester 1	<input type="checkbox"/> No

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Interactive Media Design and Production	ECS521U	15	5	Compulsory	2	Semester 1	No
Studio Practice Course Year 2 Human and Machine	DEN212	30	5	Core	2	Semesters 1 & 2	No
Composites for Aerospace Applications	MAT5030	15	5	Compulsory	2	Semester 2	No
Engineering Materials for Design	DEN5002	15	5	Compulsory	2	Semester 2	No
Creative Group Project	ECS520U	15	5	Compulsory	2	Semester 2	No
Materials Selection in Design	MAT602	15	6	Compulsory	3	Semester 1	No
Innovation Strategy	MAT307	15	6	Compulsory	3	Semester 1	No
Studio Practice Course Year 3 GDP Industry Related Design Project	DEN327	30	6	Core	3	Semesters 1 & 2	No
Studio Practice Course Year 3 Individual Design Project Joie de Vivre	DEN329	30	6	Core	3	Semesters 1 & 2	No
Interaction Design	ECS612U	15	6	Compulsory	3	Semester 2	No
Digital Media and Social Networks	ECS637U	15	6	Compulsory	3	Semester 2	No
Design and Innovation Year 4 Major Design Project	DEN419	60	7	Core	4	Semesters 1 & 2	No
Design for Human Interaction	ECS712U	15	7	Elective	4	Semester 1	No
Nanotechnology and Nanomedicine	MAT7803	15	7	Elective	4	Semester 1	No
Bioengineering in Urology	DEN430	15	7	Elective	4	Semester 1	No
Introduction to Law for Scientists and Engineers	IPLM701U	15	7	Elective	4	Semester 1	No
Foundations of Intellectual Property Law and Management	IPLM702U	15	7	Elective	4	Semester 2	No
Chemical and Biological Sensors	MAT707	15	7	Elective	4	Semester 2	No

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Advanced Environmental Engineering	DEN420	15	7	Elective	4	Semester 2	<input type="checkbox"/> No
Medical Ethics and Regulatory Affairs	DEN7020	15	7	Elective	4	Semester 2	<input type="checkbox"/> No
Interactive System Design	ECS733U	15	7	Elective	4	Semester 2	<input type="checkbox"/> No
Cognitive Robotics	ECS794U	15	7	Elective	4	Semester 2	<input type="checkbox"/> No
Robotics	DEN408	15	7	Elective	4	Semester 2	<input type="checkbox"/> No
Whole System Design in Sustainable Engineering	DEN7433	15	7	Elective	4	Semester 2	<input type="checkbox"/> No
Clinical Measurements	DEN406	15	7	Elective	4	Semester 2	<input type="checkbox"/> No
Environmental Properties of Materials	DEN7040	15	7	Elective	4		<input type="checkbox"/> No
Manufacturing Processes	DEN7713	15	7	Elective	4		<input type="checkbox"/> No

What Are the Entry Requirements?

Students will be admitted typically with: BEng: 3As at A level including maths or physics, art or design technology or equivalent creative subjects, with consideration following interview of overall abilities and motivation.

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

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.

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 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.

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 BEng programmes.

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

Within the School, the Director of External Relations is responsible for industrial liaison. As part of this role, an extensive range of new employability training, weekly timetabled careers slots and field trip visits to more than 20 collaborating companies have been instigated for all students in the school. The relationship with the Careers Group within QM is strong and we now offer joint events that are timetabled each week. 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, 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.

The programme has an industry sponsored project in the 3rd year with DePuy.

Programme Specification Approval

Person completing Programme Specification

Dr Karen Shoop

Person responsible for management of programme

Dr Karen Shoop

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

11 Jan 2019

Date Programme Specification approved by Taught Programmes Board