# PROGRAMME SPECIFICATION

<table>
<thead>
<tr>
<th>Awarding body/institution:</th>
<th>Queen Mary University of London</th>
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<tr>
<td>Teaching institution (if different from above):</td>
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<tr>
<td>Name of the final award and Programme title:</td>
<td>MSc Medical Electronics and Physics</td>
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<tr>
<td>Duration of Study/Period of Registration</td>
<td>1 year full time</td>
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<tr>
<td>UCAS code:</td>
<td>F3Q7</td>
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<tr>
<td>QAA Benchmark Group</td>
<td>Engineering/Materials</td>
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<tr>
<td>Academic Department/s involved in programme delivery</td>
<td>School of Engineering and Materials Science. External lecturers run some lectures / courses, but all course codes are School teaching codes</td>
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<td>If accredited by a professional/statutory body, please give the name, date of last accreditation visit, approximate date of next visit and details of exemptions that will be given to QMUL graduates.</td>
<td>Institute of Physics and Engineering in Medicine</td>
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## Criteria for admission to the programme

Students will be admitted typically with:

- 2:2 BSc or BEng (or equivalent) in a relevant science or engineering discipline (electronic engineering, physics or mechanical/medical engineering), or appropriate work experience.

## Aims of the programme
The **overall aims** of the programme are:

- to provide an advanced education in the field of Medical Electronics & Physics, of a standard recognised to be amongst the highest in UK institutions;
- to provide an accredited MSc programme, as part of the NHS training programme for Clinical Engineers.
- to offer challenging programmes with a multi-disciplinary approach to the elements of electronics and physics that underpin medicine;
- to educate our students in the scientific principles underpinning a wide range of medical equipment and techniques;
- to provide an understanding of the relationship between their discipline and social, economic and environmental issues and constraints.
- to implement taught material within the scope of an individual research project
- to enable all our students to achieve their academic potential by providing a stimulating, friendly and supportive environment;
- to enable students to participate in advanced research and industrial developments in clinical engineering and medical electronics.
- to prepare our graduates with discipline-specific knowledge and transferable skills that will equip them for employment and continued professional development through self-learning.

**Learning outcomes for the programme**

Students who have successfully completed the MSc in Medical Electronics & Physics will:

- have acquired an in-depth knowledge of clinical engineering and medical electronics, and be equipped to apply this to finding practical solutions to medical engineering problems
- have acquired sufficient knowledge of the fundamentals of physiology and medicine to be able to apply these engineering applications.
- be able to critically assess feasibility of the existing analytical and experimental techniques and propose practical methods for their improvement.
- have the ability to analyse and solve problems individually and in groups,
- have the ability to communicate knowledge and ideas verbally and in written reports,
- have enthusiasm and a spirit of enquiry or continued learning throughout their careers
- recognise the responsibilities of the professional clinical engineer.

**Knowledge and Understanding**

Understand appropriate fundamental engineering and electronics principles related to applications in Medical electronics and physics

**Cognitive skills**

Be able to reason clearly and critically
Be able to apply engineering principles to a range of medically related applications
Be able to understand both the application and limitation of mathematical, computational and experimental techniques available to a clinical engineer.

**Practical skills**

Possess general study skills
Be able to carry out a substantial piece of individual work whose structure and content is largely self-determined
Develop skills of presentation

**Transferable skills**
Be fluent in basic numerical skills
Be able to manage their time efficiently
Be able to work co-operatively within a team
Be computationally competent
Be able to develop significant team working skills

Teaching, learning and assessment strategies

The programme will encompass two components:
1. Eight taught modules encompassing a wide range of topics in medical electronics and physics. These are designed to bring all students to the same advanced level in physics and electronics (irrespective of their backgrounds) as applied to medicine. All eight are compulsory, to ensure students are fully equipped to follow the clinical engineering pathway.
2. A three month individual research project supervised by a member of staff and on a topic agreed with that staff member. Preferably and whenever possible the initial background research in this project should be conducted within the scope of the taught Research Methods module, and should allow the student to explore one of the topics covered in lectures in greater detail.

The assessment operates in accordance with the London University Course-Unit Regulations and established College procedures. It will be carried out through coursework, written and oral examination and by inspecting the MSc thesis produced at the end of the programme. The project is to be presented and defended orally.

Programme structure(s) and requirements, levels and modules

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<tr>
<th>Semester A:</th>
<th>MELM003 Surgical Techniques and Safety</th>
<th>MELM006 Radiation Physics and Lasers</th>
<th>MELM007 Physiology</th>
<th>MELM008 Medical Analogue Electronics</th>
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<td>Semester B:</td>
<td>DENM014 Research methods and Experimental Techniques</td>
<td>MELM004 Digital Electronics</td>
<td>DENM024 Clinical Measurements</td>
<td>MELM005 Ultrasound and Imaging</td>
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<td>Semester C:</td>
<td>MELM001 Research Project</td>
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Quality assurance mechanism (please include details of: SSLC meetings, student feedback mechanisms, personal tutor arrangements, programme induction, programme review and monitoring.)
A postgraduate induction programme is run for all postgraduate students during week 0, including introductory talks, tours and lunches.

The School has a Student Staff Liaison Committee for postgraduate students, which provides a forum for students from all taught and research postgraduate programmes to be fully represented. The post-graduate Student-Staff Liaison Committee meets twice during each semester. The Committee is comprised as below:
- Postgraduate Tutor (Chair)
- One programme director from each programme of study represented
- One representative from the library services.
- One postgraduate student from each programme of study.
- One administrator.

Two questionnaires are also handed out each semester, to provide all students with the opportunity to feedback on the course.

In addition, each student has regular meetings with their programme organiser, to feedback any concerns.

The programme is reviewed and monitored in line with all programmes within SEMS, with each module organiser reviewing their module for discussion in teaching committee. In addition, each module is reviewed by the external examiners as part of the monitoring process.

Employers Links
Please provide details of any links with employers e.g.
- Details of advisory panels that include current or potential employers;
- Organisations that regularly employ graduates from this programme and the roles that graduates undertake.
- Student prizes donated by organisations that may offer employment to graduates from this programme.

If there are no links with employers consider the learning outcomes and transferable skills and explain how these might be used to inform employers about the qualities and skills a graduate from this programme might be expected to have.

A range of the lectures across the modules are provided by external lecturers, who are recognised experts in their fields. These provide potential links to future employers and provide students with the opportunity of assessing the some of the wide ranging future career opportunities for this subject area. Career options include the NHS and clinical science and engineering, as well as companies such as De Puy, Johnson & Johnson or other smaller medical equipment and design companies. There are also a range of opportunities to move into research, with the project element providing an exciting opportunity to experience this field.

The programme is an accredited MSc towards the Clinical Engineering pathway, run by the Institute of Physics and Engineering in Medicine. A large number of graduates from the programme enter the NHS as Clinical Scientists to finish their training after completing this programme of study. In addition, a number of students are released from NHS jobs one day a week, to take the course part time as part of their clinical engineering training programme.

The school also has an active Industrial Liaison forum (ILF) and runs two events each year to bring in companies and encourage networking and employer links, both for research within the department and also for student career opportunities.
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<th>Person Completing Programme Specification</th>
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<tr>
<td>Person responsible for management of programme</td>
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<tr>
<td>Date programme specification agreed by School Education Board</td>
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<tr>
<td>Date of approval by Faculty Board/SMD Education Board</td>
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<td>Date of update/amendment</td>
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