

### PROGRAMME SPECIFICATION

Degrees:

| Programme Title                                             | Final Award | Duration of study/ years | Programme & Route code                     | Level |
|-------------------------------------------------------------|-------------|--------------------------|--------------------------------------------|-------|
| Robotics Engineering                                        | BEng        | 3                        | USEF-QM4ENG1/USROBZ                        | 6     |
| Robotics Engineering with industrial experience in year 3/4 | BEng        | 4                        | USEF-QM5ENB1/USROIZ<br>USEF-QM5ENB2/USROIZ | 6     |
| Robotics Engineering with year abroad                       | BEng        | 4                        | USEF-QM5ENA1/USROYZ                        | 6     |
| Robotics Engineering                                        | MEng        | 4                        | USEF-QM5ENG1/USROBZ                        | 7     |
| Robotics Engineering with industrial experience in year 4/5 | MEng        | 5                        | USEF-QM6ENG1/USROIZ<br>USEF-QM6ENG2/USROIZ | 7     |
| Robotics Engineering with year abroad                       | MEng        | 5                        | UMEF-QMENNY1/USROYZ                        | 7     |

|                                                       |                                                                                                    |
|-------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>Ownership</b>                                      |                                                                                                    |
| Awarding institution:                                 | Queen Mary University of London                                                                    |
| Teaching institution                                  | Queen Mary University of London                                                                    |
| Academic Department(s) involved in programme delivery | School of Engineering and Materials Science<br>School of Electronic Engineering & Computer Science |
| Main location(s) of study                             | Mile End Road, London                                                                              |
| <b>External references</b>                            |                                                                                                    |
| QAA Benchmark Group                                   | Engineering                                                                                        |
| <b>External Accreditor (if applicable)</b>            | IMechE                                                                                             |
| Accreditation received                                | 2024 (IMechE)                                                                                      |

|                                                         |                       |
|---------------------------------------------------------|-----------------------|
| <b>Specification Details</b>                            |                       |
| Programme Lead                                          | Prof Kaspar Althoefer |
| Student cohorts covered by specification                | 2024 entry            |
| Date of introduction of programme                       | September 2021        |
| Date of programme specification / amendment             | 28 November 2024      |
| Approval by School Education Committee                  | 28 November 2024      |
| Submitted to Directorate of Governance & Legal Services | 29 November 2024      |

## 1. Programme Overview

Our Robotics Engineering programme, the first of its kind in the UK, combines the best elements of the Schools of Electronic Engineering and Computer Science and of Engineering and Materials Science. The two Schools have combined their state-of-the-art teaching facilities and internationally leading research with a programme designed to cover a wide range of general and specialised topics in the field of robotics engineering, mechatronics, automation and artificial intelligence. The programme offers the opportunity to gain in-depth technical knowledge of robotics, as well as hands-on experience and numerous transferable skills through engagement with industry.

Whether your interests lie in the robotics used in medicine or manufacturing, in ways robots can be made more intelligent or constructed of different materials, this programme will provide the foundations and specialist knowledge you need. The choice of modules available allows you to get a general grounding in the science and engineering underlying robotics engineering, like applied mechanics, control engineering, software engineering and intelligent systems and to specialise in areas like industrial (manufacturing and logistic) robotics, medical robotics, cognitive robotics, or soft robotics. By the end of the programme, you will have developed the skills to design, program and build robots from beginning to end of the construction process, to serve a wide range of applications in the modern world.

The first two years of the Robotics Engineering BEng programme at QMUL provide a firm grounding in subjects fundamental to all branches of Engineering, including Mechanics and mechanical engineering, Programming and Software Engineering, Electronics, Signal Processing and Control. These topics are developed further in core robotics modules covering specialised subjects such as robot kinematics and dynamics, mechatronic systems design, advanced programming of robotic systems, that run through all three years. The programme also includes group and individual project work learning activities. The third year gives you the opportunity to further advance your expertise and select specialised modules on artificial intelligence, signal processing, advanced engineering modelling and other topics. The third year also includes a design project, which centres around the design, analysis and prototyping and validation of a robotic system based on hardware and/or software elements. You will be supported by the academics from the Centre for Advanced Robotics @ Queen Mary University of London who are world-leading experts in intelligent robots and systems, control and sensing, mechatronics and biomedical technologies. You will have access to cutting edge resources of the robotics and electronics laboratories, high-performance computer classrooms and MakerSpace.

If you choose to follow the MEng programme you will study specialised robotics courses, such as cognitive robotics, biomedical applications of robotics, computer vision, machine learning, real-time control and other advanced topics.

Opportunities to engage with industry through internships, seminars and research projects will help you to understand how your skills can be applied and increase your confidence in seeking work after graduation. Our graduates work in large and medium-size businesses, start-ups and not-for-profit organisations in automation, information technology, manufacturing, aerospace, telecommunications, energy, transport, business consulting and other rapidly developing sectors.

The Robotics Engineering degree programmes is pending accreditation by the Institution of Mechanical Engineers (IMechE) and fully meet the academic benchmark requirements for registration as a Incorporated Engineer at BEng level and Chartered at MEng level. Students are entitled to become graduate members of IMechE, IET and BCS on graduation. Enrolment as a student member of the institutions is also encouraged.

The programme aims to:

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

The MEng programme additionally aims to develop

- an appreciation of the relative merits and financial implications of a proposed engineering solution as they affect those who must put them into practice
- the detailed skills needed for you to undertake a research / development / design project in depth, understanding the technical, financial and time limitations

## 2. Learning outcomes for the programme

In this degree programme we place strong emphasis not only on the technical content of our modules, such as mechanics, electronics, programming and computational modelling, system integration, but also on cross disciplinary skills vital for an engineer to be effective in the work place. We embed these skills in the technical modules on the programme, to ensure that the technical knowledge and understanding works as you progress through your degree, and also to allow you to graduate with skills you can apply to a range of future careers or higher-level study. We have mapped our modules to a range of graduate attributes that we would like you to develop, within the areas of creativity, resilience, communication, technical and professional practice in order to produce well-rounded, interested and highly employable graduates.

The programme will develop concepts and disciplinary skills related to the academic content and graduate attributes, which are listed below. Over the duration of your programme you will develop the tools to recognise and record your development in these areas.

### 2.1 Academic Content

|           |                                                                                                                                                                             |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A1</b> | <b>Core scientific principles.</b> Understand the core engineering, scientific and mathematical principles needed to underpin engineering and computer science professions. |
| <b>A2</b> | <b>Disciplinary concepts.</b> Understand, apply and critique a broad range of disciplinary concepts related to Mechanical Engineering.                                      |
| <b>A3</b> | <b>Problem solving.</b> Apply engineering approaches to solve problems, relating to risks, costs, safety, reliability, aesthetics and environmental impact.                 |
| <b>A4</b> | <b>Key technologies.</b> Fundamentally understand state-of-the-art technologies related to Mechanical Engineering.                                                          |
| <b>A5</b> | <b>Systems design and optimisation.</b> Design and optimise a broad range of products, processes and systems, based on key technical and sustainability related factors.    |

|           |                                                                                                                                                                 |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A6</b> | <b>Experimental design and delivery.</b> Plan, execute and communicate the outputs of an experiment or project.                                                 |
| <b>A7</b> | <b>Experimental approaches.</b> Use and integrate a wide range of computational and experimental approaches to solve engineering and computer science problems. |
| <b>A8</b> | <b>Engineering economics.</b> Understand economic evaluation and business principles relevant to engineering.                                                   |
| <b>A9</b> | <b>Engineering responsibility.</b> Understand the roles and responsibility of engineers in society and their impact on both a local and global context.         |

## MEng

|           |                                                                                                                                                                                                                            |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A1</b> | <b>Core scientific principles.</b> Understand the core engineering, scientific and mathematical principles needed to underpin robotics engineering professions.                                                            |
| <b>A2</b> | <b>Disciplinary concepts.</b> Understand, apply and critique a broad range of advanced disciplinary concepts related to robotics engineering.                                                                              |
| <b>A3</b> | <b>Problem solving.</b> Apply engineering approaches to solve a wide range of advanced problems, relating to risks, costs, safety, reliability, aesthetics and environmental impact.                                       |
| <b>A4</b> | <b>Key technologies.</b> Fundamentally understand advanced state-of-the-art technologies and understanding their capabilities and limitations related to robotics engineering.                                             |
| <b>A5</b> | <b>Systems design and optimisation.</b> Design and optimise a broad range of products, processes and systems, based on key technical and sustainability related factors.                                                   |
| <b>A6</b> | <b>Experimental design and delivery.</b> Plan, execute and communicate the outputs of an experiment or project.                                                                                                            |
| <b>A7</b> | <b>Experimental approaches.</b> Use and integrate a wide range of advanced computational and experimental approaches to solve robotics engineering problems and be able to interpret the results affected by uncertainties |
| <b>A8</b> | <b>Engineering economics.</b> Understand economic evaluation and business principles relevant to engineering.                                                                                                              |
| <b>A9</b> | <b>Engineering responsibility.</b> Fully understand the roles and responsibility of engineers in society and their impact on both a local and global context.                                                              |

## 2.2 SEMS graduate attributes

Five areas related to the graduate attributes you will develop whilst you are studying in SEMS have been defined as Resilience, Creativity, Communication, Professional Practice and Technical.

### Resilience (R1-R3)

In your studies and career there may be times where things do not go exactly how you planned. Being resilient is all about your ability to cope with setbacks and criticism, motivate yourself to overcome obstacles, and stay calm under pressure. You might explore your resilience when reflecting on how you have adapted to a problem-based learning exercise as part of your programme or attend workshops that explore the importance of this skill for your personal and professional development.

### Creativity (Cr1 – Cr4)

As an engineer you will need to identify real-world problems and design creative approaches to solve them. You may develop your critical thinking abilities when reviewing complex, and

sometimes controversial information from sources, or showcase your creativity by developing innovative design approaches in laboratory and practical work.

#### **Communication (Co1 – Co4)**

Good communication skills are important not only for helping you to express your own ideas but to listen and provide feedback to others. You will be asked to show your ability to communicate information both verbally, in writing and using other digital technologies to a range of audiences, in both individual and group situations.

#### **Professional Practice (P1 – P5)**

From learning about effective ways to manage projects to considering the commercial aspects of developing a new product, you will need a range of knowledge and tools for future success in industry and research. You will be able to practice project management approaches through practical work in your modules, which will also develop an awareness of health and safety. You will also be introduced to topics such as intellectual property and research ethics.

#### **Technical (T1 – T6)**

The fundamental practical attributes important for engineering careers from design and manufacturing techniques to the analysis and risk assessment of engineering and computer systems are included in this area. Programming is increasingly important whether it is a higher level computer software development or programming of micro-controllers. Engineering and research design projects will test your ability to analyse a complex engineering problem, select appropriate manufacturing techniques to build your prototypes to help solve your specific challenge, and use statistics to understand the risks and uncertainty associated with your planned design. You will be introduced to computer programming software through taught modules and use your knowledge to interpret and model large amounts of data as part of practical assignments and projects.

By the end of your degrees students from the Robotics programme will be able to:

|     |                       |                                                                                                                             |
|-----|-----------------------|-----------------------------------------------------------------------------------------------------------------------------|
| R1  | Adversity             | Adapt to changes in the face of adversity                                                                                   |
| R2  | Self-worth            | Recognise, respect and value the individual worth of yourself.                                                              |
| R3  | Long-term development | Identify clear personal, study and career goals, taking responsibility for your own development.                            |
| Cr1 | Critical thinking     | Evaluate complex or contradictory information, data and processes in order to make judgements and decisions.                |
| Cr2 | Problem-solving       | Identify and solve real world problems, developing creative solutions with a full awareness of sustainability.              |
| Cr3 | Product design        | Apply creativity in product and systems design, incorporating different disciplinary and cultural perspectives.             |
| Cr4 | Systems               | Evaluate, model and improve a range of multifaceted systems.                                                                |
| Co1 | Verbal communications | Be effective in verbal communication, develop speaking and listening skills, and provide and receive constructive feedback. |
| Co2 | Written communication | Convey complex technical, professional and other information in written form to suit a range of audiences.                  |

|     |                                     |                                                                                                                                                                                       |
|-----|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Co3 | Communication technologies          | Use a range of digital technologies to facilitate effective verbal, graphical and visual communication of technical ideas with engineers, scientists, technicians and a lay audience. |
| Co4 | Team work                           | Work effectively in a team, appreciating different team roles including leadership.                                                                                                   |
| P1  | Project management                  | Use project management tools and develop skills to deliver projects in industry, research and elsewhere.                                                                              |
| P2  | Ethics and codes of conduct         | Understand and comply with professional engineering and scientific ethics and codes of conduct.                                                                                       |
| P3  | Health and safety                   | Understand the importance of health and safety (H&S) from personal, professional and corporate responsibility viewpoints.                                                             |
| P4  | Commercial awareness                | Have a working knowledge of intellectual property (IP) considerations and other commercial aspects of product development.                                                            |
| P5  | Regulation and quality assurance    | Have a working knowledge and ability to comply with relevant regulatory frameworks, quality assurance processes and good laboratory practice.                                         |
| T1  | Manufacturing techniques            | Evaluate and select the appropriate prototyping and manufacturing techniques.                                                                                                         |
| T2  | Laboratory and practical techniques | Plan, use and record data from laboratory and workshop techniques pertinent to the discipline of study.                                                                               |
| T3  | Risk and uncertainty                | Evaluate risk and uncertainty using appropriate statistical methods applied to engineering and scientific problems and other evaluation methods.                                      |
| T4  | Design of experiments               | Design tests and experiments to fabricate or synthesise different engineering systems, components or materials, and to measure or monitor their performance or properties.            |
| T5  | Computer programming                | Use computer programming to model and solve science and engineering problems.                                                                                                         |
| T6  | Software tools                      | Use common software tools for engineering design & analysis.                                                                                                                          |

### 3 Learning and teaching approaches

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 combination of methods including lectures, tutorials, laboratory sessions, industrial visits, workshops and group work. QMUL degrees combine face to face teaching and practical experiences, with supported and structured on-line learning. Our virtual learning platform is referred to as QMplus. Through this platform you will be able to find details about your modules, assessments, timetables and other activities.

Projects throughout the programme are designed for you to exercise independent thinking, research and problem solving skills and are preferably undertaken in a related subject. Group projects enhance your communication, organisational as well as technical skills.

As a student graduating on the BEng programmes after three years you will be well-prepared to attain the Chartered Engineer status by study of a Matching Section such as an MSc and gaining and evidencing sufficient professional experience, and many do this. Nationwide, these students provide the bulk of engineering graduates for employment, having a broad background in Engineering. However you will not have the in-depth analysis capabilities of the final MEng year, although you can develop this through work experience.

The 4<sup>th</sup> Year, leading to the MEng degree, consists of advanced subjects and a major project in which a typical industrial environment is simulated. The project accounts for half of the final year and places a greater demand on you as an MEng student in terms of your organisational, interpersonal and problem-solving skills than you will have faced in earlier years. In addition to the project, you will take four elective modules. Fourth year options contain material usually covered at postgraduate level and involve specialisation. The 4<sup>th</sup> Year therefore will challenge you to develop and apply your intellectual prowess, problem-solving skills, independence and project-management skills. All these are central to the profile of a well-rounded engineer which industry wishes to see in graduates.

### **3.1 Employers Links**

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, DePuy, Baxter, Artis, Corus, BAe, DSTL, Rolls Royce, Shadow Robot, Ocado Technologies, Google DeepMind, SAGA Robotics, National Nuclear Laboratories, Siemens. The ILF takes place twice a year, in Autumn and Spring.

### **3.2 Assessment methods**

You can expect a variety of different types of assessment methods:

Written assessment

- Examinations
- Progress tests
- Online assignments, quizzes and tests
- Report and other writing
- Peer assessment

Practical assessment

- Laboratory/workshop practicals
- Design work
- Programming tests
- CAD & simulation tool tests

Oral assessment

- Oral presentations
- Poster presentations
- Group presentations
- Design presentations

Assessments allow you to demonstrate that you have met the intended learning outcomes for each module and contribute towards your achievement of the programme learning outcomes. There are summative (formal) assessments during and/or at the end of each module and well as ongoing formative (informal – no marks) through the degree. Examinations are intended to assess understanding rather than recall. Group assessments may incorporate peer marking.

Assessments operate in accordance with QMUL Regulations and established procedures. Feedback is provided through a number of formats, including:



- Oral (e.g. face to face during or after face-to-face sessions, video)
- Personal (e.g. discussion with staff)
- Interactive (e.g. Team Based Learning, peer-to-peer, online quizzes)
- Written (e.g. solutions, model answers, comments on work)

You will receive feedback on intermediate, developmental assessments such as project plan and progress reports and on coursework assessments. This feedback may be summarised for the whole cohort or be directed towards your work individually

Feedback is intended to help you learn and you are encouraged to engage with it, reflect upon it and discuss it with your module organiser. Feedback will be provided on coursework and practical assessments within an appropriate time. Feedback on examination performance is available upon request from the module leader and overall class performance feedback on a question-by-question basis may also be provided.

### 3.3 Support of students

We aim to support all students throughout their time with us. We encourage students to develop independently but this does not mean that you need to be alone. We know that support and encouragement from staff and fellow students is very important throughout your degree.

Your Advisor is first point of contact for any personal support; they can be contacted by email with any questions or to arrange an appointment. You can also contact the Student Support Officer via email on [sems-office@qmul.ac.uk](mailto:sems-office@qmul.ac.uk).

#### 3.3.1 Advisor arrangements

As a first year student you will be allocated an Advisor when you register and this Advisor will normally remain with you for the whole of your time at QMUL. You will meet with your Advisor at least twice per semester, but can always book more meetings if you need help.

#### 3.3.2 Central support services

##### Disability and Dyslexia Service

QMUL 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 QMUL students at all campuses and all sites.

##### Advice and Counselling

QMUL offers a wide range of advice, guidance and self-help material. These free and confidential professional services are available to all students.

## 4 Programme structure

| Year 1  |          |                                            |            |        |
|---------|----------|--------------------------------------------|------------|--------|
| Module  | Semester | Title                                      |            | Credit |
| EMS402U | A        | Engineering Design                         | Compulsory | 15     |
| EMS410U | A        | Experimental Design and Practice 1         | Compulsory | 15     |
| EMS412U | A        | Computational and Mathematical Modelling 1 | Compulsory | 15     |



|         |     |                                            |            |    |
|---------|-----|--------------------------------------------|------------|----|
| ECS401U | A   | Procedural Programming                     | Compulsory | 15 |
| EMS450U | B   | Exploring Engineering                      | Compulsory | 15 |
| EMS420U | B   | Experimental Design and Practice           | Compulsory | 15 |
| EMS418U | B   | Computational and Mathematical Modelling 2 | Compulsory | 15 |
| ECS414U | B   | Object-Oriented Programming                | Compulsory | 15 |
| EMS499U | A&B | Skills for engineers                       | Compulsory | 0  |

## Year 2

| Module  | Semester | Title                                             |            | Credit |
|---------|----------|---------------------------------------------------|------------|--------|
| EMS516U | A        | Introduction to Robotics                          | Compulsory | 15     |
| EMS512U | A        | Instrumentation and Measurements                  | Compulsory | 15     |
| ECS533U | A        | Introduction to Artificial Intelligence           | Compulsory | 15     |
| EMS515U | A        | Introduction to Spacecraft Dynamics               | Compulsory | 15     |
| EMS520U | B        | Neuromechanics and Bioelectricity of Movement     | Compulsory | 15     |
| EMS507U | B        | Control System Analysis and Design                | Compulsory | 15     |
| EMS511U | B        | Robot Design and Mechatronics                     | Compulsory | 15     |
| EMS506U | B        | Numerical Methods and Data Science in Engineering | Compulsory | 15     |
| EMS599U | A&B      | Professional Engineering Skills                   | Compulsory | 0      |

## Year 3

| Module  | Semester | Title                                      |            | Credit |
|---------|----------|--------------------------------------------|------------|--------|
| EMS690U | A&B      | Integrated Design Project                  | Core       | 30     |
| EMS627U | A        | Modelling and Control of Robotic Systems   | Compulsory | 15     |
| ECS638U | A        | Design for Human Interaction               | Compulsory | 15     |
| EMS624U | A        | Functional Materials                       | Elective   | 15     |
| EMS619U | A        | Biomedical Device Development              | Elective   | 15     |
| EMS620U | A        | Processing and Analysis in Medical Imaging | Elective   | 15     |
| EMS628U | B        | Advanced Robotic Systems                   | Compulsory | 15     |
| ECS659U | B        | Neural Networks and Deep Learning          | Compulsory | 15     |
| EMS622U | B        | Sustainability Assessments for Design      | Elective   | 15     |
| EMS603U | B        | Vehicles for the Future                    | Elective   | 15     |

## Year 4

| Module  | Semester | Title                                               |            | Credit |
|---------|----------|-----------------------------------------------------|------------|--------|
| EMS727U | A        | Mechatronics                                        | Compulsory | 15     |
| EMS726U | A        | Engineering Design Optimisation and Decision Making | Elective   | 15     |
| ECS709U | A        | Introduction to Computer Vision                     | Elective   | 15     |

|         |     |                                                              |            |    |
|---------|-----|--------------------------------------------------------------|------------|----|
| EMS740U | A   | Machine Learning and Artificial Intelligence for Engineering | Elective   | 15 |
| EMS704U | B   | Simulation and Model Based Systems Engineering               | Elective   | 15 |
| EMS700U | A&B | Industry / Research Project                                  | Core       | 60 |
| EMS729U | B   | Cognitive Robotics                                           | Compulsory | 15 |
| EMS707U | B   | Digital Signal Acquisition & Processing                      | Elective   | 15 |
| EMS701U | B   | Medical Robotics and Surgical Techniques                     | Elective   | 15 |
| EMS771U | A   | Engineering Project management                               | Elective   | 15 |

The credit load for elective modules are to be balanced across semesters.

Students taking programmes which include a year abroad will take an additional year after your Year 2 studies

|         |     |                          |      |     |
|---------|-----|--------------------------|------|-----|
| EMS598U | A&B | Engineering Study Abroad | Core | 120 |
|---------|-----|--------------------------|------|-----|

Students taking programmes which include with industrial experience will take an additional year after your Year 2 or Year 3 studies

|         |     |                       |      |     |
|---------|-----|-----------------------|------|-----|
| EMS696U | A&B | Industrial Experience | Core | 120 |
|---------|-----|-----------------------|------|-----|

Note: The modules, structure and assessments presented in this Programme Specification are correct at time of publication but might change as a result of student and staff feedback and the introduction of new or innovative approaches to teaching and learning. You will be consulted and notified in a timely manner of any changes to this document.

## 5 Quality assurance

### 5.1 Student Voice Committee (SVC) meetings

The School has a Student Voice Committee and students on this programme are represented on this committee. The committee meets twice during each semester and is made up of the following members:

- Academic Lead for Student Experience (Chair)
- Student Support Officer (Secretary)
- Relevant academic staff
- At least one student representing each year cohort of the relevant programme

The elections for the undergraduate representatives are organised through the Student Union. SVC agendas and minutes are found on the SEMS QMPlus landing page (<https://qmplus.qmul.ac.uk/course/view.php?idnumber=SEMS-Home>). Relevant items on the minutes are referred to the appropriate School committees, module organisers and programme directors for consideration and feedback.

### 5.2 Evaluating and improving the quality and standards of teaching and learning

We assess our provision of teaching by:

- Module review by means of student experience questionnaires and module organisers' reports.
- Annual staff appraisal.
- Peer observation of teaching.
- External examiners' reports.

- Periodic Programme Review by the University.

The Committees within SEMS that have responsibility for monitoring and evaluating quality and standards are

- Education Committee
- Student Experience Committee
- Academic Standards Committee
- Student Voice Committee
- Subject Examination Boards
- Degree Examination Boards

The ways we receive student feedback on the quality of teaching and your learning experience are:

- Annual National Student Survey
- Student Voice Committee
- Student Experience Questionnaire evaluation for each of your modules
- Student forums on QMPlus, including module and programme specific forums as well as ones covering more general topics
- Discussions with Advisors

### **5.3 Staff development**

Our staff are continuously engaging with professional development activities, including courses and workshops related to teaching and learning.