



DUBLIN CITY UNIVERSITY
FACULTY OF ENGINEERING AND COMPUTING
SCHOOL OF MECHANICAL AND MANUFACTURING
ENGINEERING

**Masters (MEng) in Mechanical and
Manufacturing Engineering**

Information Booklet for Prospective Students



Masters in Engineering (MEng) in Mechanical and Manufacturing Engineering

Programme Overview

This Masters programme allows the students to specialise in the widely established area of Mechanical and Manufacturing Engineering or to widen their knowledge from their undergraduate studies. It enables graduates to apply MEng Level 9 learning outcomes using computer-based technology to solve mechanical and manufacturing engineering problems. This programme introduces the use of advanced Computer Aided Engineering tools and, by experiencing these advanced techniques and software, the graduate will gain a vital edge. It allows the candidate to keep up with the rapidly changing manufacturing and design sectors. In addition, students can opt for a specialist Major in one of four areas: Simulation-driven Design, Advanced Manufacturing, Sustainable Systems and Energy, or Biomedical Engineering.

Depending on the student's entry qualification, a number of entry routes to the MEng programme are possible: Direct entry, through an Access Course, through a Qualifier Programme, or through the International Foundation Programme.

EI Accreditation

The MEng in Mechanical and Manufacturing Engineering programme is accredited by Engineers Ireland at level 9.

Programme Listing

MEng in Mechanical and Manufacturing Engineering (DC814/DC816)

The *MEng* programme is a one-year (full-time) level 9 Master programme. It is also offered in part-time mode (typically over two years).

Access Course to the MEng in Mechanical and Manufacturing Engineering (DC812)

The *Access Course* is an alternative entry route to the MEng programme for students who do not have a primary degree in Mechanical and/or Manufacturing Engineering, but have a level 8 H2.2 Bachelor degree in a science/technology/other engineering based area. It is a one-year part-time course.

Qualifier Programme B for the MEng in Mechanical and Manufacturing Engineering (DC838)

The *Master Qualifier Programme B* is an alternative entry route to the MEng programme for students who have a level 8 H3 degree in Mechanical and/or Manufacturing Engineering. It is a one-year part-time course.

International Foundation Programme (DC827, DC671)

The *International Foundation Programme* is an alternative entry route to the MEng programme for students who are non-native English speakers and do not meet DCU's English language requirements. It is a one-year full-time course.

Note: The International Foundation Programme for all Master programmes is managed by the School of Applied Language & Intercultural Studies (SALIS).

Entry Requirements

Direct Entry to the M.Eng in Mechanical and Manufacturing Engineering

- An H2.2 level 8 (NFQ level 8 qualification) Honours degree in Mechanical and/or Manufacturing Engineering

Access Course

- An H2.2 level 8 (NFQ level 8 qualification) Honours degree in a Science/Technology based degree (Applied Physics, Mathematics, Computer Science, etc.), **OR**
- An H2.2 level 8 (NFQ level 8 qualification) Honours degree in other areas of engineering (Electrical/Electronic Engineering, Mechatronic Engineering, Civil Engineering, etc.)

Qualifier Programme B

- An H3 level 8 (NFQ level 8 qualification) Honours degree in Mechanical and/or Manufacturing Engineering

Note:

NFQ – National Framework of Qualifications (see www.nfq.ie).

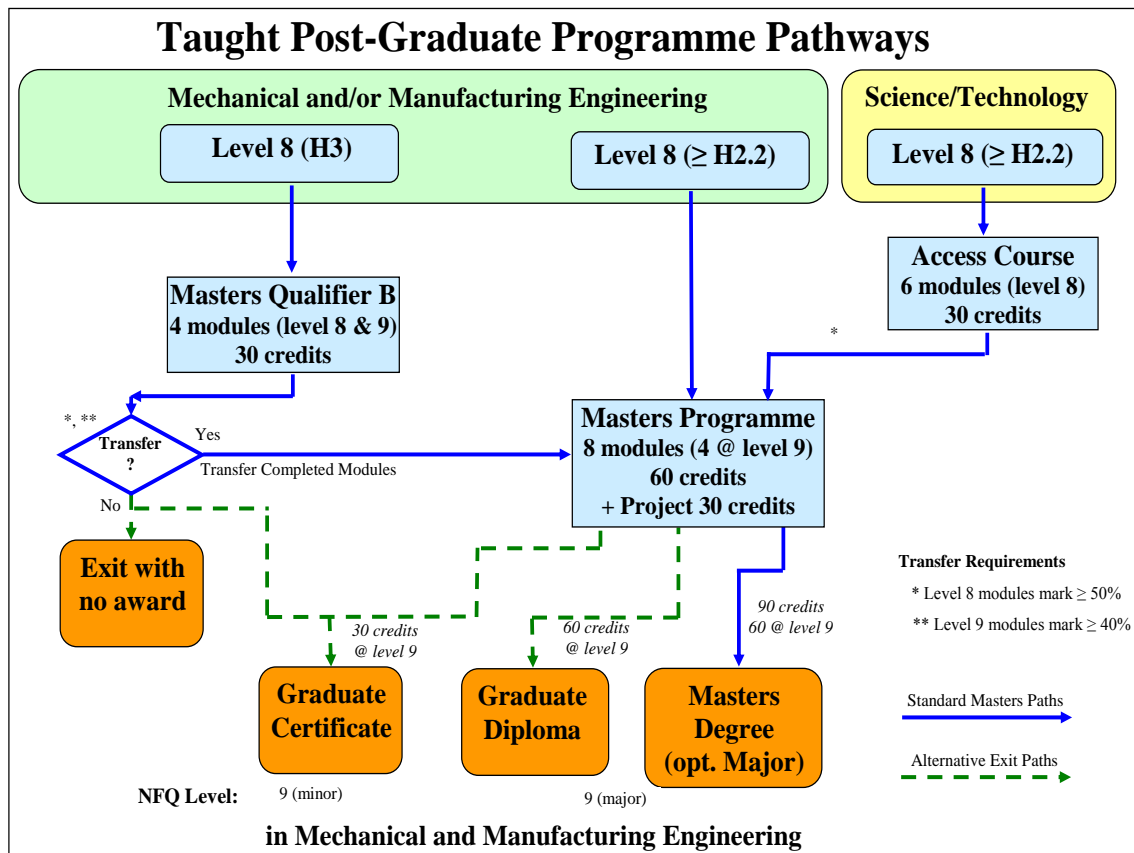
International Applications:

International candidates are expected to have educational qualifications of a standard equivalent to those outlined above. In addition, where such candidates are non-native speakers of the English language they must satisfy DCU's English language requirements. For further information on international applications see the web page of the International Office:

<https://www.dcu.ie/international>

Programme Structure, Pathways

The graph below shows the various entry and exit routes and possible pathways of the MEng programme.



Alternative Exit Awards

Regardless of the entry route, the normal exit qualification from the programme is an MEng in Mechanical and Manufacturing Engineering, with an optional Major. However, there exist two alternative exit awards:

Graduate Diploma in Mechanical and Manufacturing Engineering

The Graduate Diploma (GD) is an alternative exit from the MEng programme for students who are not eligible for the MEng award (not enough credits and/or not enough level 9 credits). If a student has accumulated 60 credits from level 9 modules (excluding the Project), he/she may be awarded a Graduate Diploma in Mechanical and Manufacturing Engineering. The necessary 60 credits can be accumulated by passing eight level 9 modules (8 x 7.5 credits)

Note: for the GD the number of credits from level 8 modules is irrelevant; only credits from level 9 modules are counted.

The GD is at level 9 (major award) according to the NFQ.

Note: students can not apply for GD directly through the application system, nor can they register for it. It is an alternative exit from the MEng programme.

Graduate Certificate in Mechanical and Manufacturing Engineering

The Graduate Certificate (GC) is an alternative exit from the MEng or Masters Qualifier B programmes for students who are not eligible for the MEng or GD awards (not enough credits and/or not enough level 9 credits). If a student has accumulated 30 credits from level 9 modules (excluding the Project), he/she may be awarded a Graduate Certificate in Mechanical and Manufacturing Engineering. The necessary 30 credits can be accumulated by passing four level 9 modules (4 x 7.5 credits)

Note: for the GC the number of credits from level 8 modules is irrelevant; only credits from level 9 modules are counted.

The GC is at level 9 (minor award) according to the NFQ.

Note: students can not apply for GC directly through the application system, nor can they register for it. It is an alternative exit from the MEng programme.

Modes of Study, Programme Duration

Full-time/Part-time mode

The programmes/courses can be studied in Full-time or Part-time mode (depending on the course). In full-time mode, the student registers for modules with a total of 30 credits per semester. In part-time mode, the student (usually) registers for modules with a total of 15 credits per semester.

Below is the duration and distribution of modules per semester/year:

MEng in Mechanical and Manufacturing Engineering (DC814/DC816)

The MEng programme is available in full-time or part-time mode.

MEng		Year 1			Year 2		
		Semester 1	Semester 2	Summer	Semester 1	Semester 2	Summer
Full-time	Taught modules	30 credits (4 modules at level 9)	30 credits (4 modules at level 9)				
	Project	30 credits, level 9 (year-long)					
Part-time	Taught modules	15 credits (2 modules at level 9)	15 credits (2 modules at level 9)		15 credits (2 modules at level 9)	15 credits (2 modules at level 9)	
	Project				30 credits, level 9 (year-long)		

Access Course to the MEng in Mechanical and Manufacturing Engineering (DC812)

Access Course		Year 1		
		Semester 1	Semester 2	Summer
Part-time	Taught modules	15 credits (3 modules at level 8)	15 credits (3 modules at level 8)	

Note: Module credits from the Access Course are not carried over to the MEng programme.

Qualifier Programme B for the MEng in Mechanical and Manufacturing Engineering (DC838)

Masters Qualifier B		Year 1			Year 2		
		Semester 1	Semester 2	Summer	Semester 1	Semester 2	Summer
Masters Qualifier B	Taught modules	15 credits (2 modules at level 8/9)	15 credits (2 modules at level 8/9)				
MEng	Taught modules				15 credits (2 modules at level 8/9)	15 credits (2 modules at level 8/9)	
	Project				30 credits, level 9 (year-long)		

Note: Module credits from the qualifier programme are carried over to the MEng programme.

Note: the maximum number of academic sessions during which the student is registered for a programme (including repeated and deferred years) is four. This means that the programme/course has to be completed within four academic sessions.

On-campus/Off-campus mode

In order to provide greater flexibility for students, each of the programmes/courses can be studied in either on-campus or off-campus mode.

On-campus mode:

On-campus mode is the preferred mode of study for full-time students. It means that the student attends all classes (lectures, tutorials, labs).

Off-campus mode:

Off-campus mode is usually preferred by part-time students who have a part-time job, or due to other restrictions (remote location, etc.) are unable to attend classes regularly. In off-campus mode students would mainly study independently (from module notes and textbooks provided by the module lecturer) without attending lectures. However, they would be required to attend some labs (depending on the module).

Note: a small number of modules are only available in on-campus mode.

Note: off-campus students sit their exams at Dublin City University together with the on-campus students.

Programme Start Dates

The MEng programme and all its linked courses start at the beginning of the academic year in Semester 1 (usually at the end of September). Only one entry/start in each academic year is offered.

Applications / Deadlines

Applications

All applicants (both EU and non-EU students) should apply through DCU's application system:

<https://dcuie.elluciancrmrecruit.com/Apply/>.

You can find a quick step-by-step guide if you need help with your application at (you need to register to the application system first):

<https://www.dcu.ie/your-guide-to-student-application-portal>

Deadlines

The usual deadline for applying for the MEng programme and associated courses in each academic year is:

EU students: 31 August

Non-EU students: 15 July

Actual deadlines can be found on the application site.

Applicants who require a study visa for the purposes of gaining entry into Ireland are advised to apply as early as possible.

Fees

Up-to-date information on fees for EU and non-EU students is available on the university's Finance Office web pages:

<https://www.dcu.ie/finance>

Detailed Programme Information

MEng in Mechanical and Manufacturing Engineering (DC814/DC816)

General Information

The *MEng* programme is a one-year (full-time) level 9 Master programme. It is also offered in part-time mode (typically over two years).

For the MEng award, modules with a total of 90 credits should be accumulated, out of which at least 60 credits should be from level 9 modules, and the remaining 30 credits can be from level 8 modules. The project is worth 30 credits (at level 9), so for the MEng qualification eight 7.5 credit modules have to be selected (out of which at least four modules have to be at level 9).

Level 9 modules (with module codes MM5** or EE5**) are specifically developed for the masters programme. It is recommended that MEng students only select level 9 modules. However, in some cases (for example when a level 9 module has a pre-requisite module and a student had not studied that module or an equivalent one, which can happen with external applicants), the pre-requisite level 8 module can be selected instead of a level 9 module. Level 8 modules (with module code MM4**) are from year 4 of existing undergraduate programmes offered by the School.

Modules

Semester 1:

Module Code	CORE module (MUST take it)	Level	Credit
MM533	Research Practice and Methodology	9	7.5

Module Code	Optional modules	Level	Credit
MM421*	Finite Element Analysis (pre-requisite for MM524)	8	7.5
MM432*	Heat Transfer and Fluid Mechanics (pre-requisite for MM532)	8	7.5
MM523	Product Design, Development and Value Analysis	9	7.5
MM530	Surface Engineering and Tribology	9	7.5
MM584	Manufacturing Systems Simulation	9	7.5
EE535	Energy System Decarbonisation: Technology & Policy	9	7.5
MM535	Energy Auditing and Energy Management	9	7.5

* Select MM421 and MM432 if you had not studied them or similar modules, as they are pre-requisites for modules in semester 2.

Semester 2:

Module Code	Optional modules	Level	Credit
MM524	Advanced FEA (pre-requisite: MM421 Finite Element Analysis or similar)	9	7.5
MM532	Computational Thermo-Fluid Dynamics (pre-requisite: MM432 Heat Transfer and Fluid Mechanics or similar)	9	7.5
MM555	Manufacturing Process Analysis & Tool Design	9	7.5
EE507	Entrepreneurship for Engineers	9	7.5
MM536	Advanced Sustainable Energy Systems	9	7.5
MM537	Whole Life Cycle Analysis	9	7.5
MM500	Design for Clinical Practice (on-campus mode!)	9	7.5

Year-long modules:

Module Code	Optional module	Level	Credit
MM517	Advanced Biomechanics and Tissue Engineering (on-campus mode!)	9	7.5

Year-long project module:

Module Code	CORE module (MUST take one of these); Code depends on major!	Level	Credit
MM542	Project in Mechanical and Manufacturing Engineering	9	30
MM543	Project in Simulation Driven Design	9	30
MM544	Project in Sustainable Systems and Energy	9	30
MM546	Project in Biomedical Engineering	9	30
MM547	Project in Advanced Manufacturing	9	30

Majors

The MEng in Mechanical and Manufacturing Engineering programme offers four majors:

- Major in Simulation-driven Design
- Major in Advanced Manufacturing
- Major in Biomedical Engineering
- Major in Sustainable Systems and Energy

In order to get a Major, the student must select an appropriate set of modules, otherwise no Major is awarded.

Note: the programme code does not depend on the Major the student may select. The student selects a Major (optional) when they register for the appropriate project and modules.

Note: the title of the degree is MEng in Mechanical and Manufacturing Engineering regardless of the Major.

No Major

Select these modules:

Code	Module title	Sem.	Level	Credit
MM533	Research Practice and Methodology	1	9	7.5
MM542	Project in Mechanical and Manufacturing Engineering	YL	9	30

Select the remaining 7 modules (7.5 credits each) from the full list of modules.

Major in Simulation-driven Design

Simulation-driven design implements advanced computer aided engineering software and techniques from the very beginning of the product development cycle. The simulation technology can drastically lower the time that product development takes. Instead of simply analysing and testing existing products and systems, simulation can pre-validate designs at an early stage. This is a required trend in Industry 4.0-enabled manufacturing and design.

Select these modules:

Code	Module title	Sem.	Level	Credit
MM533	Research Practice and Methodology	1	9	7.5
MM584	Manufacturing Systems Simulation	1	9	7.5
MM555	Manufacturing Process Analysis & Tool Design	2	9	7.5
MM524	Advanced FEA	2	9	7.5
MM532	Computational Thermo-Fluid Dynamics	2	9	7.5
MM543	Project in Simulation-driven Design	YL	9	30

Select the remaining 3 modules (7.5 credits each) from the full list of modules.

Major in Advanced Manufacturing

Advanced manufacturing deals with the developments in the manufacturing field during the last decades. It includes high tech, innovative processes, clean and green processes, and flexible manufacturing. Advanced manufacturing makes extensive use of specialised computer software and information technologies. Advanced manufacturing industries integrate new innovative technologies in both products and processes. This major prepares students to design, operate, and manage advanced manufacturing processes and systems.

Select these modules:

Code	Module title	Sem.	Level	Credit
MM533	Research Practice and Methodology	1	9	7.5
MM523	Product Design, Development and Value Analysis	1	9	7.5
MM530	Surface Engineering and Tribology	1	9	7.5
MM584	Manufacturing Systems Simulation	1	9	7.5
MM555	Manufacturing Process Analysis & Tool Design	2	9	7.5
MM547	Project in Advanced Manufacturing	YL	9	30

Select the remaining 3 modules (7.5 credits each) from the full list of modules.

Major in Sustainable Systems and Energy

Sustainable systems and energy engineering prepares graduates with the knowledge and competence to meet the changing world of sustainability and the growing global challenge of transitioning to zero carbon, environmentally sound, reliable, affordable and sustainable energy systems.

There is a growing international market for Engineers in sustainable energy and development, eco-innovation, resource efficiency and clean-tech sectors. There are lots of career opportunities in the growing fields of Energy/Renewable Energy (wind, wave, solar, biomass etc.); a national priority area for Ireland.

Select these modules:

Code	Module title	Sem.	Level	Credit
MM533	Research Practice and Methodology	1	9	7.5
EE535	Energy System Decarbonisation: Technology and Policy	1	9	7.5
MM535	Energy Auditing and Energy Management	1	9	7.5
MM536	Advanced Sustainable Energy Systems	2	9	7.5
MM537	Whole Life Cycle Analysis	2	9	7.5
MM544	Project in Sustainable Systems and Energy	YL	9	30

Select the remaining 3 modules (7.5 credits each) from the full list of modules.

Major in Biomedical Engineering

This discipline integrates the necessary aspects of biology and medicine with the technical engineering aspects required to engineer medical devices. The world of medicine is evolving and expanding rapidly, with new treatments and new diseases appearing all the time. As Ireland is a major player in bioengineering, this Major provides graduates with specialisms required by industry.

Select these modules:

Code	Module title	Sem.	Level	Credit
MM533	Research Practice and Methodology	1	9	7.5
MM517	Advanced Biomaterials and Tissue Engineering (on-campus mode!)	YL	9	7.5
MM500	Design for Clinical Practice (on-campus mode!)	2	9	7.5
MM524	Advanced FEA	2	9	7.5
MM532	Computational Thermo-Fluid Dynamics	2	9	7.5
MM546	Project in Biomedical Engineering	YL	9	30

Select the remaining 3 modules (7.5 credits each) from the full list of modules.

Note: MM500 and MM517 can only be studied in on-campus mode, so the Major in Biomedical Engineering is only suitable for full-time students.

Note: Since MM517 is a year-long module, the Major in Biomedical Engineering will result in a slightly unbalanced semestrial module workload: 33.75 vs. 26.25 credits per semester plus the year-long project.

Masters Project

Each student on the MEng programme must complete a Masters Project (worth 30 credits at level 9). The project is a year-long module and spans over the summer as well.

Depending on the (optional) type of Major the student wants to achieve, a project in that area has to be developed.

The project always starts in September and finishes in August the following year (within the same academic year).

The student needs to make sure that they are registered for the correct project module. Once registered, they need to contact the project coordinator and select a suitable project in the correct area.

Access Course to the MEng in Mechanical and Manufacturing Engineering (DC812)

General Information

The Access Course provides an alternative entry route to the MEng programme for students who do not have a primary degree in Mechanical and/or Manufacturing Engineering but have an H2.2 Science/Technology based degree or a degree in other areas of engineering (Electronic Engineering, Civil Engineering, etc.). It aims at equalising the student's knowledge to level 8 Mechanical/Manufacturing Engineering by providing core Level 8 modules from existing undergraduate programmes. The Access Course itself does not carry an award.

The Access Course is a part-time, one year programme. It includes six five credit level 8 core (compulsory) modules with a total credit of 30. The student must pass each module with a minimum mark of 50%. The credits from the Access Course are not carried over to the MEng programme. After successful completion of the Access Course the student is eligible to register for the MEng in Mechanical and Manufacturing Engineering programme. They can register for MEng in September of the next academic year.

Modules

Module Code	Module Title (MUST take ALL modules)	Level	Credit	Semester
EM201	Engineering Mathematics III	8	5	1
MM252	Manufacturing Processes 1	8	5	1
MM306	Mechanics of Machines 2	8	5	1
EM202	Engineering Mathematics IV	8	5	2
MM212	Strength of Materials II	8	5	2
MM227	Thermofluid Mechanics	8	5	2

Qualifier Programme B for the MEng in Mechanical and Manufacturing Engineering (DC838)

General Information

The Master Qualifier Programme B is an alternative entry route to the MEng programme for students who do not meet the normal MEng entry requirements but have a level 8 H3 degree in Mechanical and/or Manufacturing Engineering and several years of relevant work experience. Its aim is to give students the knowledge, experience and skills required to study level 8 and 9 modules at sufficient level and to enter the Masters programme in Mechanical & Manufacturing Engineering. It is also useful for students who had not studied some of the pre-requisite modules of the modules in the MEng programme. It is a one-year part-time course. Successful completion of the Qualifier B programme allows the student to progress to the MEng programme. The Qualifier programme itself does not carry an award, but the credits from it are transferred to the MEng programme.

The Qualifier Programme B is a part-time, one year programme. It includes four 7.5 credit modules at level 8 or 9 with a total credit of 30. The student must pass each level 8 module with a minimum mark of 50%, and each level 9 module with a minimum mark of 40%. After successful completion of the Qualifier Programme the student is eligible to register for the MEng in Mechanical and Manufacturing Engineering programme. They can register for MEng in September of the next academic year.

The module listing is the same as for the MEng programme, but only four modules are selected (two per semester). Students selecting level 8 modules need to be aware that after transferring to MEng at least 60 credits have to be accumulated from level 9 modules (including the project).

The module listing for the Qualifier Programme B is the same as for the MEng programme.

Note: when selecting modules take into account what Major you may want to select in the MEng programme.

Detailed Module Information

The module descriptors with detailed information for each module (indicative content, assessment, etc.) can be found at:

http://www.dcu.ie/registry/module_school.shtml

From the menu select (with the slider bar) School Mechanical Engineering; this brings up all modules taught by the school.

Programme Codes

DCU Code	Application Code	Programme/Course
MMME	DC814 (FT) DC816 (PT)	MEng in Mechanical and Manufacturing Engineering (Full-time and Part-time)
MMAC	DC812 (PT)	Access Course to MEng
MMQA	DC832 (PT)	Qualifier A for MEng (for Level 7 graduates in Mech./Manuf. Eng)
MMQB	DC838 (PT)	Qualifier B for MEng (for Level 8 H3 graduates in Mech./Manuf. Eng)
IFPCME	DC827 (YL)	International Foundation Programme (Year-long, and Single-semester)
IFPSCM	DC671 (SS)	

Contact Information

Chairperson of the MEng in Mechanical and Manufacturing Engineering Programme:

Dr. Tamas Szecsi
phone: +353 1 700-8300
email: tamas.szecsi@dcu.ie