

# Engineering

(Common Entry Programme)

**B.A., M.A.I Masters Degree in Engineering (NFQ Level 9)**

**Optional (exit after fourth year):**

**B.A., B.A.I. Honours Bachelors Degree in Engineering (NFQ Level 8)**



Course Code	CAO Points 2022	Places 2022	Duration
TR032	554	185	4 years (5 years with a master's)

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MODULE DETAILS



## What is Engineering?

Engineering is about being creative in technical problem solving. Engineers make things possible by using mathematical and scientific principles together with analytical and design skills. They tackle existing problems by developing new solutions through innovative technologies.

They also expand the frontiers of society by developing advanced materials, sustainable energy systems, construction technologies, transport systems, biomedical devices and telecommunications infrastructure.

## Engineering: The course for you?

We have been teaching Engineering at Trinity since 1841. There have been immense developments since that time, but the continuity of excellence in teaching and learning is a source of pride for us and our graduates. A distinctive feature of Engineering at Trinity is the two-year common programme, in which all students learn the fundamentals of engineering science and also engage in substantial elements of project work prior to choosing a specific engineering discipline. Trinity is the top-ranked university in Ireland, and our engineering graduates use this to their advantage all over the world as well as in Ireland.

Engineering is a constantly evolving profession. As an engineer, you will need to be adaptable both to the rapid development of new ideas and technology and to the shifting requirements of industry and society. You will need to be a good communicator and be capable of working as part of a team. Above all, you must be a problem solver. You must be creative and able to synthesise and analyse information from different sources to arrive at efficient and practical solutions.

## Engineering at Trinity

Trinity is ranked in the top 142 universities worldwide for Engineering (QS World University Rankings by Subject 2021) and offers outstanding teaching by engineers who are at the forefront of their field worldwide. It has a strong philosophy of research-led teaching and continuously benchmarks itself against the top international engineering schools. The engineering course offers the opportunity to carry out research as part of your course with the aim of producing graduates capable of participating to research projects at the highest national and international levels. There are opportunities for work placements in Ireland and abroad as well as study abroad opportunities as part of the degree programme. The engineering programme is fully accredited by Engineers Ireland up to master's level (M.A.I.) and offers excellent career prospects in Ireland and abroad.

## Graduate skills and career opportunities

Engineering graduates from Trinity have the capacity to think independently but also to work in teams. They can use technical understanding to problem solve in a wide range of technical areas. They are able to communicate their technical and creative ideas to other professionals and to society at large. They are able to take responsibility, deal with complexity and ambiguity and successfully face open-ended challenges.

## Your degree and what you'll study

The B.A.I./M.A.I. (engineering) degree programme is based on two years of general engineering, providing students with a firm grounding in the principles common to all disciplines, followed by two/three years of specialisation. Graduates are professionally accredited engineers with both a broad-based understanding of the whole discipline and a detailed knowledge of their chosen specialist area. The aim is that graduates will be able to continuously train themselves, to adapt and move into related or newly emerging areas as their careers develop after graduation.

## GET IN TOUCH!

[www.tcd.ie/engineering](http://www.tcd.ie/engineering)



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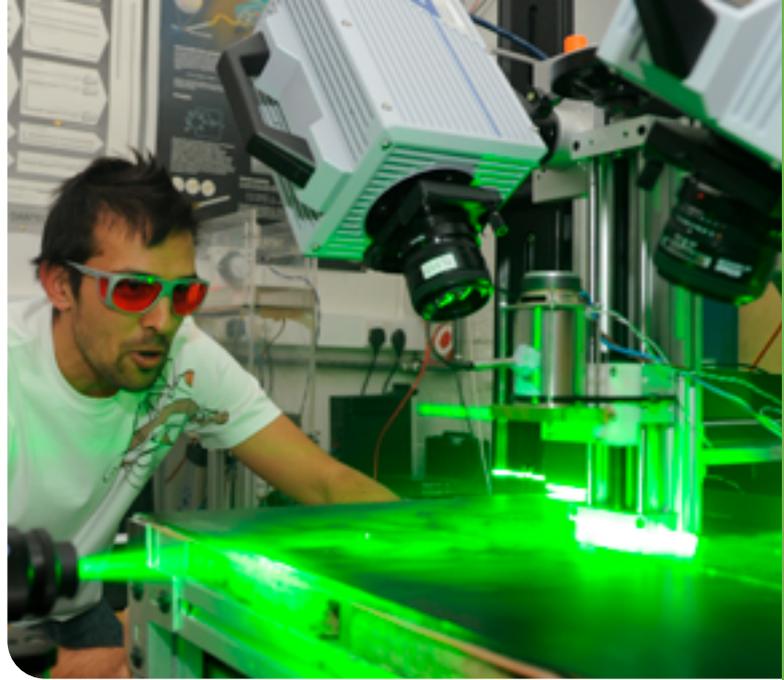


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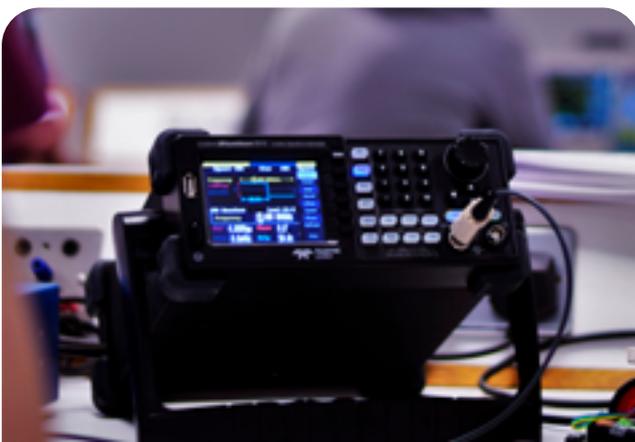
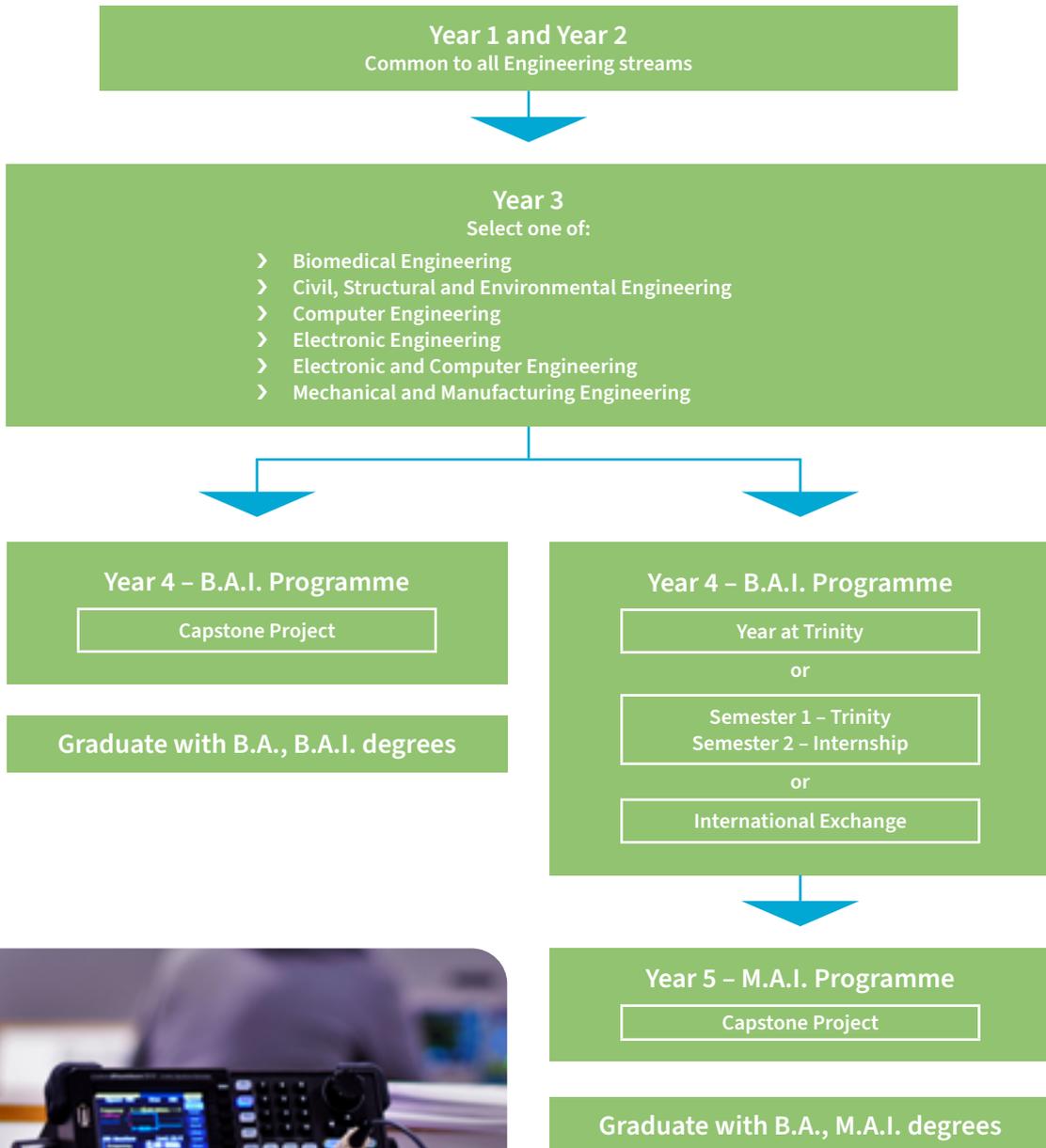


### Special Entry Requirements

Leaving Certificate	H4	Mathematics
Advanced GCE (A Level)	Grade C	Mathematics
International Baccalaureate	HL Grade 5	Mathematics



### Engineering Course Structure



# Mechanical and Manufacturing Engineering



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MODULE DETAILS



Students who wish to study mechanical and manufacturing engineering apply to the engineering degree (TR032).

The first two years are common to all engineering students and at the end of the second-year students select mechanical and manufacturing engineering as their specialist area.

See page 138 for details of the first two years.

## What is Mechanical and Manufacturing Engineering?

This is often seen as the broadest of all engineering qualifications as the skills required range from mathematics and electronics to metal fatigue and fluid mechanics. Nearly all machines used in everyday life – from the car or washing machine to the most complex aircraft or electricity supply plant to the tiniest surgical instrument – have required the skills of a mechanical engineer. Every industrial plant or manufacturing operation relies on a mechanical engineer for its smooth running and efficiency.

Mechanical engineers are involved in design, testing, inspection and manufacture of mechanical devices and components. As a mechanical engineer you will work as a professional using technology to make the world a better, safer place.

## Graduate skills and career opportunities

Our graduates have taken jobs in companies such as: High tech manufacturing (Intel, Pfizer, DePuy, National Instruments, Seagate, Siemens); Automotive (Jaguar, Rover, BMW, Dromone); Engineering and Business Consultancy (Arup, Deloitte, Accenture); Energy (OpenHydro, ESB, Eirgrid, EDF, Vattenfall); and Process Engineering (Cameron Flow Control, Procter & Gamble, Syngenta, Glanbia, Kerry).

Our graduates went on to master's and Ph.D. programmes in Universities such as: RCSI; University of Edinburgh, Imperial College London, University of Cambridge, ETH Zürich, KTH Royal Institute of Technology, Université Grenoble Alpes, and Massachusetts Institute of Technology.

As well as the potential for a career in mainstream mechanical or manufacturing engineering, graduates have found work in industries as diverse as film production, financial services and aircraft leasing and management. There is also a demand for specialist research and development work in industry, research organisations and universities. Opportunities

exist for graduates in mechanical and manufacturing engineering to find employment in Ireland and elsewhere in engineering consultancies, public utilities (transport, power generation) and manufacturing industries in the mechanical, electronic and biomedical sectors.

## Your degree and what you'll study

- Mechanics – how things like cars, wind turbines and rugby players move, deform and break
- How to design new machines and technology, for example a phone charger for developing countries
- Advanced manufacturing techniques such as rapid prototyping
- How heat and energy can be captured, used and managed (how to keep electronics cool as they become more powerful and more compact)

Course topics include: Energy; Solid Mechanics; Engineering Materials; Fluid Mechanics; Manufacturing Technology and Systems; Dynamics; Mechatronics; and Engineering Design.

In third year you will study core engineering subjects, specialised mechanical and manufacturing engineering subjects and a Trinity Elective module. In fourth year and optional master's (fifth) year you will choose from a wide range of technical and non-technical modules, tailoring your degree to suit your own interests.

Project work is an important aspect of this degree and there is an extensive research facility available to students. You will carry out several projects, including a major Capstone research project in your final year. Some examples of final-year projects include:

- Study of jet engine exhaust noise
- Design and build an entry for 'Robot Wars'
- Design and construction of energy storage devices for the developing world
- Pedestrian car impact simulation
- Bamboo: study of structure and mechanical properties

## GET IN TOUCH!

[www.tcd.ie/mecheng](http://www.tcd.ie/mecheng)

 [julee@tcd.ie](mailto:julee@tcd.ie)

## DO YOU ENJOY...

Imagining new solutions to problems?

Exploring how machines and technology work?

Complex problems?

Using computers and mathematics to apply physics to the real world?

