

BE (HONS) (ELECTRICAL AND ELECTRONIC) ENGINEERING

Overview

Students enter First Year Engineering (<https://ucc-ie-public.courseleaf.com/programmes/beg/>) and complete a common programme of study. In Second Year students enter separate programmes leading to degrees in:

- Civil, Structural and Environmental Engineering,
- Electrical and Electronic Engineering,
- Energy Engineering and
- Process and Chemical Engineering.

Note: At the end of Third Year students may register for the BE (Hons) Electrical and Electronic Engineering (p. 1) / ME Pathway (Electrical and Electronic) (<https://ucc-ie-public.courseleaf.com/programmes/eembp/>). Students who choose not / are not eligible to register for the BE (Hons) / ME Pathway (Electrical and Electronic) will continue to Fourth Year of the BE (Hons) (Electrical and Electronic).

Second Year - Electrical and Electronic Engineering

No student may register for Second Year until he/she has passed the First University Examination in Engineering. In order to be admitted to the Second University Examination in Electrical and Electronic Engineering, a student must have satisfactorily attended, subsequent to passing the First University Examination in Engineering, prescribed modules to the value of **60** credits.

Third Year - Electrical and Electronic Engineering

No student may register for Third Year until he/she has passed the Second University Examination in Electrical and Electronic Engineering. In order to be admitted to the Third University Examination in Electrical and Electronic Engineering, a student must have satisfactorily attended, subsequent to passing the Second University Examination in Electrical and Electronic Engineering, prescribed modules to the value of **60** credits.

Year Abroad (Third Year)

On the recommendation of the Head of the School of Engineering and Architecture and subject to the approval of the College of Science, Engineering and Food Science, a student may be permitted to undertake the Third Year of his/her BE studies at an approved institution abroad following a study programme equivalent to **60** credits. Where a language other than English is the language of instruction at the approved host institution, up to **20** credits of the programme may be dedicated to formal study of the language of instruction, subject to the approval of the Head of School of Engineering and Architecture. The detailed programme of study shall be proposed by the student in consultation with the approved host institution and the Director of the BE (Electrical and Electronic Engineering) Programme, and shall require the approval of the Head of School of Engineering and Architecture.

The student will be examined by the approved host institution. A student who achieves a pass standard, as defined by the approved host institution, will be deemed to have passed the Third University Examination in Electrical and Electronic Engineering. A student who fails to achieve a pass standard, as defined by the approved host institution, will be deemed to have failed the Third University Examination in

Electrical and Electronic Engineering and will be eligible to undertake the Third Year programme at UCC in a Repeat Year. The detailed transcript of results will be communicated by the host institution to the Autumn Examination Board, UCC, and will form part of the student's formal academic record.

Registered Second Year Electrical and Electronic Engineering students who have achieved a 2H1 in First Year may apply to undertake the Third Year of their BE studies abroad. An application to study abroad must be made to the Head of the School of Engineering and Architecture by **31st January**. Permission to undertake the Third Year of study abroad will be conditional on the student achieving at least a 2H1 in the Second University Examination in Electrical and Electronic Engineering at the Summer Examination.

The number of students who may be permitted to undertake the Third Year of study abroad will be limited by the number of places available in any given year at approved host institutions.

Entry to the ME in Electrical and Electronic Engineering

Entry to the ME in Electrical and Electronic Engineering (<https://ucc-ie-public.courseleaf.com/programmes/meel/>) is determined based on student performance during Third Year. Students who pass the Third University Examination in Electrical and Electronic Engineering, achieving at least a 2H2 will be eligible to register for Fourth Year of the ME Pathway (Electrical and Electronic) (<https://ucc-ie-public.courseleaf.com/programmes/eembp/>). In the case of students that have completed one full semester or a full year of studies abroad during Third Year, performance during the Second Year is taken into consideration, with a minimum of 2H1 in the Second Year Examination required for eligibility, in addition to passing the Third Year examination. Students who are eligible to register for the ME Pathway (Electrical and Electronic), but choose not to, will continue to Fourth Year of the BE (Hons) (Electrical and Electronic). Students passing the Third University Examination in Electrical and Electronic Engineering who are ineligible to register for the ME Pathway (Electrical and Electronic) will continue to Fourth Year of the BE (Hons) (Electrical and Electronic).

Fourth Year - Fourth Year - BE (Hons) / ME Pathway Electrical and Electronic

In Fourth Year students complete either the **BE (Hons)** or the **ME (Electrical and Electronic) Pathway**.

No student may register for Fourth Year until he/she has passed the Third University Examination in Electrical and Electronic Engineering. In order to be admitted to the BE (Hons) Degree / ME Pathway (Electrical and Electronic) Examination, a student must have satisfactorily pursued, subsequent to passing the Third University Examination in Electrical and Electronic Engineering, modules to the value of **60** credits.

Work Placement Module in Fourth Year (BE Hons)

A student who wishes to take the elective module, EE4060, in Fourth Year is required to have made final arrangements, as prescribed by the Module Co-ordinator, for the work placement by **31 May** of their Third year. The work placement is undertaken during the period, June to September, after the Third Year University Examination. The module is described in the *Book of Modules*. Further information is available from the Module Co-ordinator.

Change of Registration in Fourth Year from ME (Electrical and Electronic) Pathway. to BE (Hons) (Electrical and Electronic)

A student may elect to change registration to Fourth Year of the BE (Hons) provided formal notification is received by the Student Records and Examinations Office (sreo@ucc.ie) before the end of Week 8 of Semester 1 of Fourth Year.

Fifth Year - ME Electrical and Electronic Engineering

No student may register for Fifth Year of the ME until he/she has passed the Fourth Year ME Pathway University Examination in Electrical and Electronic Engineering. In order to be admitted to the Final ME (Electrical and Electronic) Degree Examination, a student must have satisfactorily attended, subsequent to passing the Fourth ME Pathway University Examination in Electrical and Electronic Engineering, prescribed modules to the value of **60** credits.

Programme Requirements

For information about modules, module choice, options and credit weightings, please go to Programme Requirements (p. 2).

Programme Requirements

| Code | Title | Credits |
|---|---|---------|
| Year 1 | | |
| Students take 60 credits as follows: | | |
| <i>Core Modules</i> | | |
| CE1003 | Introduction to Structural and Civil Engineering | 5 |
| CE1005 | Engineering Computation and Problem Solving | 5 |
| CM1001 | Chemistry for Engineers | 5 |
| EE1007 | Introduction to Electrical and Electronic Engineering | 5 |
| MA1011 | Mathematical Methods I | 5 |
| MA1012 | Mathematical Methods II | 5 |
| ME1002 | Engineering Thermodynamics | 5 |
| NE1001 | Introduction to Energy Engineering | 5 |
| PE1003 | Introduction to Process and Chemical Engineering | 5 |
| PY1006 | Physics for Engineers II | 5 |
| PY1012 | Physics for Engineers I | 10 |
| Year 2 | | |
| Students take 60 credits as follows: | | |
| <i>Core Modules</i> | | |
| EG2002 | Numerical Methods and Programming | 5 |
| CE2001 | Solid and Structural Mechanics I | 5 |
| EE2011 | Digital Electronics | 5 |
| EE2012 | Linear Circuit Analysis | 5 |
| EE2013 | Non-Linear Circuit Analysis | 5 |
| EE2014 | Signals and Systems 1 | 5 |
| EE2015 | Signals and Systems 2 | 5 |
| EE2016 | Electrical Power Engineering I | 5 |
| EE2017 | Electrical Power Engineering II | 5 |
| EE2020 | Semiconductor Devices | 5 |
| MA2013 | Mathematics for Engineering | 5 |
| ST1051 | Introduction to Probability and Statistics | 5 |
| Year 3 | | |
| Students take 60 credits as follows: | | |
| <i>Core Modules</i> | | |
| EE3011 | Power Electronics & AC Machines and Systems | 5 |
| EE3012 | Electric Vehicle Energy Systems | 5 |

| | | |
|--------|--|---|
| EE3013 | Electromagnetic Fields for Engineers | 5 |
| EE3014 | Signal Processing | 5 |
| EE3015 | Telecommunications I | 5 |
| EE3016 | Control Engineering I | 5 |
| EE3018 | Analogue Integrated Circuits | 5 |
| EE3019 | Digital Integrated Circuits | 5 |
| EE3020 | Engineering Applications of Machine Learning | 5 |
| EE3022 | Electronic Circuit Design | 5 |
| EE3023 | Electronic Embedded Systems | 5 |
| ME3003 | Mechanical Systems | 5 |

Year 4

BE (Hons)

Students take **60** credits as follows - all listed core modules (**45** credits) and **15** credits of elective modules:

| | | |
|---------------------|--|----|
| EE4002 | Control Engineering II | 5 |
| <i>Core Modules</i> | | |
| EE4014 | Industrial Automation and Control | 5 |
| EE4016 | Transmission Lines | 5 |
| EE4019 | Photonic Signals and Systems Application | 5 |
| EE4050 | BE Project | 10 |
| MG4052 | Management in Practice | 5 |

Select **10** credits from the following Electrical or Electronic options: 10

Electrical

| | |
|--------|--|
| EE4001 | Energy Systems, Power Electronics and Drives (5) |
| EE4010 | Electrical Power Systems (5) |

Electronic

| | |
|--------|------------------------|
| EE4022 | Analogue IC Design (5) |
| EE4023 | Digital IC Design (5) |

Elective Modules

Students take modules to the value of **15** credits from the following: 15

| | |
|--------|--|
| EE4004 | Telecommunications II (5) |
| EE4007 | Optical Communication Systems and Devices (5) |
| EE4011 | Radio Frequency IC Design (5) |
| EE4012 | Biomedical Systems (5) |
| EE4025 | Introduction to Micro Electromechanical Systems (MEMS) (5) |
| EE4060 | BE Work Placement (5) |

Total Credits **240**

Examinations

Full details and regulations governing Examinations for each programme will be contained in the *Marks and Standards Book* and for each module in the *Book of Modules*.

Programme Learning Outcomes

Programme Learning Outcomes for BE (Electrical and Electronic) (NFQ Level 8, Major Award)

On successful completion of this programme, students should be able to:

- Apply principles from mathematics, science and engineering science to problems in electrical and electronic engineering and in the related disciplines of microelectronic and mechanical engineering;

- Apply information technology to visualise and analyse problems in electrical and electronic engineering and in the related disciplines of microelectronic and mechanical engineering;
- Identify, formulate, analyse and solve problems relating to the above mentioned engineering disciplines;
- Design components and systems to the standard required by the electronics and electrical engineering industries;
- Evaluate critically the engineering, economic, environmental and societal impacts of proposed design solutions;
- Critically evaluate published work in the technical literature;
- Work effectively as an individual, in teams and in multi-disciplinary settings;
- Effectively communicate engineering-related information and the results of one's own work (in both oral and written form);
- Understand the need for high ethical standards in the practice of engineering.