BE (HONS) (PROCESS AND CHEMICAL) ENGINEERING

Overview

NFQ Level 8, Major Award

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)/ME Pathway (Process and Chemical) (https://ucc-ie-public.courseleaf.com/programmes/pembp/). Students who choose not/are not eligible to register for the BE (Hons ME Pathway (Process and Chemical) will continue to Fourth Year of the BE (Hons) (Process and Chemical).

Second Year - Process and Chemical 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 Process and Chemical 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 - Process and Chemical Engineering

No student may register for the Third Year programme in Process and Chemical Engineering until he/she has passed the Second University Examination in Process and Chemical Engineering. In order to be admitted to the Third University Examination in Process and Chemical Engineering, a student must have satisfactorily attended, subsequent to passing the Second University Examination in 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 (Process and Chemical 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 Process and Chemical 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 Process and Chemical 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 Process and Chemical 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.

Work Placement Module in Fourth Year (BE Hons)

A student who wishes to take the elective module, PE4021, 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 Summer University Examination. Further information is available from the Module Co-ordinator.

Entry to the ME in Process and Chemical Engineering

Entry to the ME in Process and Chemical Engineering (https://ucc-ie-public.courseleaf.com/programmes/mepe/) is determined based on student performance during Third Year. Students who pass the Third University Examination in Process and Chemical Engineering, achieving at least a 2H2 will be eligible to register for Fourth Year of the BE (Hons)/ME Pathway (Process and Chemical) (https://ucc-ie-public.courseleaf.com/programmes/pembp/). 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 BE (Hons) / ME Pathway (Process and Chemical), but choose not to, will continue to Fourth Year of the BE (Hons) (Process and Chemical). Students passing the Third University Examination in Process and Chemical Engineering who are ineligible to register for the BE (Hons)/ME Pathway (Process and Chemical) will continue to Fourth Year of the BE (Hons) (Process and Chemical).

Fourth Year - BE (Hons)/ME Pathway Process and Chemical Engineering

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

No student may register for Fourth Year until he/she has passed the Third University Examination in Process and Chemical Engineering. In order to be admitted to the BE (Hons) / ME Pathway (Process and Chemical) Degree Examination, a student must have satisfactorily pursued, subsequent to passing the Third University Examination in Process and Chemical 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, PE4021, 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. A student who

makes arrangements for taking the work placement module and fails to pass the Third University Summer Examination in Process and Chemical Engineering will not be permitted to take the module for examination in Fourth Year. The module is described in the *Book of Modules*. Further information is available from the Module Co-ordinator.

Fifth Year - ME Process and Chemical Engineering

No student may register for Fifth Year of the ME in Process and Chemical Engineering (https://ucc-ie-public.courseleaf.com/programmes/mepe/) until he/she has passed the Fourth ME Pathway University Examination in Process and Chemical Engineering. In order to be admitted to the Final ME (Examination in Process and Chemical) Degree Examination a student must have satisfactorily attended, subsequent to passing the Fourth ME Pathway University Examination in Process and Chemical 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:		
Core Modules		
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 1	10
Year 2		
Students take **60** credits as follows:		
Core Modules		
AE2004	Current Trends in Ecology and Environmental Science	5
EG2001	Engineering Mechanics with Transform Methods	5
EG2002	Numerical Methods and Programming	5
CE2001	Solid and Structural Mechanics I	5
CE2003	Fluids I	5
CM2010	Introduction to Organic Chemistry for Process and Chemical Engineers	5
PE2003	Heat Transfer	5
PE2004	Communication and Ethics in Engineering	5
PE2005	Introduction to Biochemical Engineering	5
PE2009	Chemical Reaction Engineering	5
PE2011	Process Plant Design and Commissioning	5
PE2013	Data Analysis for Process and Product Development	5
Year 3		
Students take **60** credits as follows – all listed core modules (**55** credits) and **5** credits of elective modules:		
Core Modules		
CM3029	Organic Chemistry II for Process and Chemical Engineering	5
CM3030	Fundamentals of Organic Chemistry	5
PE3001	Applied Thermodynamics and Fluid Mechanics	5
PE3002	Unit Operations and Particle Technology	5
PE3003	Phase Equilibrium and Mass Transfer	5
PE3005	Process Equipment; Design, Integrity & Materials	5
PE3007	Process Dynamics and Control	5
PE3011	Sustainability and Environmental Protection I	5
PE3014	Food and Bioprocess Engineering	5
PE3015	Process Safety	5
PE3016	Process Design and Feasibility Analysis	5
Elective Modules [1]		
Students take modules to the value of **5** credits from the following:		5
NE3002	Energy in Buildings (5)	
PE3009	Pharmaceutical Engineering (5)	
Year 4		
Students take **60** credits as follows – all listed core modules (**35** credits) and **25** credits of elective modules:		
Core Modules		
PE4002	Optimisation and Continuous Process Improvement	5
PE4007	Mechanical Design of Process Equipment	5
PE4016	Pharmaceutical Process Validation	5
PE4050	Design Project	15
MG4052	Management in Practice	5
Elective Modules [1]		
Students take modules to the value of **20** credits from the following:		20
CE4016	Energy Systems in Buildings (5)	
CE4024	Progressing Toward Sustainable Industry (5)	
FE4002	Global Food Policy (5)	
ME3004	Applied Thermodynamics and Work Transfer (5)	
MG2003	Consumer Behaviour and Sustainable Consumption (5)	
NE4005	Sustainability, Bioenergy and Circular Economy Systems (5)	
PE4021	BE Work Placement (5)	
Plus modules to the value of **5** credits from the following:		5
NE3003	Sustainable Energy (5)	
PE4010	BioPharmaceutical Engineering (5)	
Total Credits		**240**

[1] Some modules may be pre-requisites for elective modules in subsequent years. While there is no upper limit on the number of students who may take a particular elective module, modules may be withdrawn if there are insufficient entrants.

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 (Hons) (Process and Chemical Engineering) (NFQ Level 8, Major Award)

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

- Demonstrate an understanding of the sciences (mathematics, chemistry, physics, biochemistry, microbiology and biotechnology) which underpin chemical engineering;
- Recognise, delineate, analyse and solve in a professional and practical way, the problems in processing industries, technical and otherwise, which are susceptible to engineering treatment;
- Apply pertinent knowledge to the practice of Process and Chemical engineering in an effective and professional manner;
- Appreciate the national and global needs for sustainable development, and the professional engineer's responsibility regarding the environment and society at large;
- Appreciate the need for the highest ethical standards in professional engineering;
- Work in multidisciplinary teams;
- Communicate effectively with the engineering community and with society at large;
- Appreciate the importance of continuing professional development.