

# ME (PROCESS AND CHEMICAL) ENGINEERING

## Overview

No student may register for Fifth Year of the ME in Process and Chemical Engineering until he/she has passed the Fourth ME Pathway University Examination in Process and Chemical Engineering (<https://ucc-ie-public.courseleaf.com/programmes/pembp/>). 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. 1).

## Programme Requirements

Code	Title	Credits
<b>Year 1 - Engineering</b>		
Students take <b>60</b> 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
<b>Year 2 - Process and Chemical Engineering</b>		
Students take <b>60</b> credits as follows:		
<i>Core Modules</i>		
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
<b>Year 3 - Process and Chemical Engineering</b>		

Students take **60** credits as follows – all listed core modules (**55** credits) and **5** credits of elective modules:

<i>Core Modules</i>		
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*<sup>1</sup>  
Students take modules to the value of **5** credits from the following: 5

NE3002	Energy in Buildings	
PE3009	Pharmaceutical Engineering	

## Year 4 - ME Pathway Process and Chemical Engineering

Students take **60** credits as follows – all listed core modules (**30** credits) in Part A and a Placement module **30** credits in Part B:

<i>Part A</i>		
<i>Core Modules</i>		
PE4007	Mechanical Design of Process Equipment	5
PE4016	Pharmaceutical Process Validation	5
PE4050	Design Project	15
NE3003	Sustainable Energy	5
or PE4010	BioPharmaceutical Engineering	
<i>Part B</i>		
<i>Core Modules</i>		
PE6060	ME Work Placement	30

## Year 5 - ME (Process and Chemical Engineering)

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

<i>Core Modules</i>		
NE6015	Data Analytics for Engineering	5
PE6030	Industrial Process Safety; Applications and Control Systems	5
PE6033	Sustainability and Environmental Protection II	5
PE6034	Complex Reaction Systems	5
PE6035	Complex Separation Processes	5
PE6050	ME Research Project	20

*Elective Modules*<sup>1</sup>  
Students take modules to the value of **5** credits as follows: 5

MG4052	Management in Practice (5)	
or PE4002	Optimisation and Continuous Process Improvement (5)	

Students take modules to the value of **10** credits as follows: 10

PE6031	Carbon Geocycles and Capture Utilisation and Storage (5)	
or PE6043	Manufacturing Excellence in the Bioprocessing Industries (5)	

NE6004	Sustainability, Bioenergy and Circular Economy Systems (5)
or PE6032	Pharmaceutical Industry Advances and Developments (5)

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**Total Credits** **300**

<sup>1</sup> 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 ME (Process and Chemical) (NFQ Level 9, Major Award)

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

- Systematically apply advanced knowledge from mathematics, science and engineering to solve complex and/or unbounded problems in Process and Chemical Engineering;
- Apply information technology and software development techniques to visualise, analyse and solve a broad range problems in Process and Chemical Engineering to an advanced level;
- Demonstrate the ability to adjust, self-evaluate and critically alter practice in response to evolving project requirements;
- Design components and systems to the standard required of a professional engineer demonstrating logical thinking and imaginative skills to provide the most appropriate solution;
- Critically evaluate the engineering, economic, environmental and societal impacts of proposed solutions;
- Critically evaluate published work at the forefront of the field in the context of a particular engineering solution;
- Work effectively as an individual, in teams and in multi-disciplinary settings with the ability to appropriately plan and meet the role responsibilities, including leadership qualities;
- Communicate effectively engineering-related information and the results of one's own work (in both oral and written form) while demonstrating appreciation of the expertise of the target audience;
- Demonstrate knowledge and understanding of the need for high ethical standards in their professional practice of engineering to the standards expected of a Chartered Engineer.