

MSc Advanced Chemical Engineering with Process Systems Engineering

This document provides a definitive record of the main features of the programme and the learning outcomes that a typical student may reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities provided. This programme specification is intended as a reference point for prospective students, current students, external examiners and academic and support staff involved in delivering the programme and enabling student development and achievement.

Programme Information

Award(s)	MSc			
Programme Title	Advanced Chemical Engineering with Process Systems Engineering			
Programme Code	H8C2			
Awarding Institution	Imperial College London			
Teaching Institution	Imperial College London			
Faculty	Faculty of Engineering			
Department	Department of Chemical Engineering			
Associateship	N/A			
Mode and Period of Study	1 academic year, full-time			
Cohort Entry Points	Annually in October			
Relevant QAA Benchmark Statement(s) and/or other external reference points	Engineering			
Total Credits	ECTS:	90	CATS:	180
FHEQ Level	Level 7			
EHEA Level	2 nd cycle			
External Accreditor(s)	IChemE			
Specification Details				
Student cohorts covered by specification	2016/17 entry			
Person responsible for the specification	Dr Jason Hallett (MSc Advanced Chemical Engineering Course Co-ordinator) and Amelia Jedynak (MSc Administrator for Advanced Chemical Engineering Programmes)			
Date of introduction of programme				

Date of programme specification/revision	October 2016
Description of Programme Contents	
<p>This programme offers students a grounding in modelling, simulation and optimisation for the process industries, while helping them to strengthen their understanding of chemical engineering. Students take 8 modules in total, composed of one, core Advanced Process Design course, a minimum of 3 process systems engineering modules, and 4 further elective modules (including the opportunity to take one business module). Additionally, they follow the professional skills workshops and join the Process Systems Engineering research theme for a year-long research project. This programme is ideal for students wishing to become fluent in the use of techniques and tools for computer-aided decision-making.</p>	
Learning Outcomes	
<p>The Imperial Graduate Attributes are a set of core competencies which we expect students to achieve through completion of any Imperial College degree programme. The Graduate Attributes are available at: www.imperial.ac.uk/students/academic-support/graduate-attributes</p>	
<p>Knowledge and Understanding of:</p> <ol style="list-style-type: none"> 1. A selection of the major topics in the subject, their recognition and underlying fundamental principles 2. Research techniques which might include information retrieval, experimental design and statistics, modelling and safety; 3. The essential facts, concepts, principles and theories relevant to the student's area of research; 4. Management and communication skills, including problem definition, project design, decision processes, teamwork, written and oral reports, scientific publications. <p>Intellectual Skills: Upon completion of the programme, students should be able to:</p> <ol style="list-style-type: none"> 1. Analyse and solve problems using a multidisciplinary approach, applying professional judgements to balance costs, benefits, safety and social and environmental impact; 2. Integrate and critically evaluate information; 3. Formulate and apply appropriate solutions; 4. Plan, conduct and write-up a programme of original research. <p>Practical Skills: Upon completion of the programme, students should be able to:</p> <ol style="list-style-type: none"> 1. Plan and execute safely a series of experiments or computations; 2. Use laboratory methods or computer-based tools to generate data; 3. Analyse results, determine their strength and validity, and make recommendations; 4. Prepare technical reports; 5. Give technical presentations; 6. Use scientific literature effectively. <p>Transferable Skills: Upon completion of the programme, students should be able to:</p> <ol style="list-style-type: none"> 1. Communicate effectively through oral presentations, computer processing and presentations, and written reports; 2. Apply knowledge and modelling skills; 	

3. Apply acquired management skills: decision processes, objective criteria, problem definition, project design and evaluation needs;
4. Integrate and evaluate information from a variety of sources;
5. Transfer techniques and solutions from one discipline to another;
6. Use Information and Communications Technology;
7. Manage resources and time;
8. Learn independently with open-mindedness and critical enquiry;
9. Learn effectively for the purpose of continuing professional development.

Entry Requirements

Academic Requirement	Minimum 2.1 Honours degree in a Physical Science, Engineering, Mathematical, or Life/Biomedical Sciences based subject.
Non-academic Requirements	None
English Language Requirement	IELTS 6.5 with a minimum of 6.0 in each element or equivalent.

The programme's competency standards document can be found at: [TBC](#)

Learning & Teaching Strategy

Scheduled Learning & Teaching Methods	<ul style="list-style-type: none"> • Lectures • Seminars • Laboratory work • Computer-based work • Skills workshops
E-learning & Blended Learning Methods	<ul style="list-style-type: none"> • N/A
Project and Placement Learning Methods	<ul style="list-style-type: none"> • Independent Research Project • Project reports

Assessment Strategy

Assessment Methods	<ul style="list-style-type: none"> • Coursework • Examinations • Practical
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Academic Feedback Policy

Coursework assignments during the year are normally marked within two weeks of submission. Early feedback to students on research performance is given following assessment of the Literature Review (submitted mid-February) and Research Presentations (mid-September).

A preliminary Examiners' Meeting is held in July to confer research marks to date, as well as provisional examination marks (which are not formally ratified until October). Some informal feedback on progress can then be given to students, including an indication of overall exam performance and research marks to date.

The exit questionnaire that all students are asked to complete upon submission of their thesis is used to monitor the effectiveness of our feedback procedures.

Re-sit Policy

The College's Policy on Re-sits is available at: www.imperial.ac.uk/registry/exams/resit

Mitigating Circumstances Policy

The College's Policy on Mitigating Circumstances is available at: www.imperial.ac.uk/registry/exams

Assessment Structure

Marking Scheme

Pass

- A candidate must have achieved at least 50% in both the taught and research components of the course. If you fail one of the components, you fail the MSc.

Merit

- A candidate must have achieved at least 60% in both the taught and research components of the course.

Distinction

- A candidate must have achieved at least 70% in both the taught and research components of the course.

Where appropriate, a Board of Examiners may award a result of pass where a candidate has achieved an aggregate mark of 50% or greater in the Exam component, but marginally failed one individual examination.

Module Weightings

Module	% Module Weighting
Advanced Process Design	6.66r%
Advanced Process Optimisation I	6.66r%
Advanced Process Operations	6.66r%
Molecular Modelling of Fluids	6.66r%
4 x elective modules	6.66r% each
Research Project	46.66r%

Indicative Module List

Code	Title	Core/ Elective	L&T Hours	Ind. Study Hours	Place- ment Hours	Total Hours	% Written Exam	% Course- work	% Practical	FHEQ Level	ECTS
CE4-06A	Advanced Process Optimisation I	CORE	30	120	0	150	75%	25%	0%	7	6
CE4-05	Advanced Process Operations	CORE	30	120	0	150	70%	30%	0%	7	6
CE4-33	Molecular Modelling of Fluids	CORE	30	120	0	150	100	0%	0%	7	6
TBC CE4-36	Advanced Process Design	CORE	30	120	0	150	70%	30%	0%	7	6
RES	Final Project	CORE	210	840	0	1050	0%	90%	10%	7	42
CE4-28	Carbon Capture & Clean Fossil Fuels	ELECTIVE	30	120	0	150	100%	0%	0%	7	6
CE3-06	Environmental Engineering	ELECTIVE	30	120	0	150	100%	0%	0%	7	6
CE3-02	Reaction Engineering 2	ELECTIVE	30	120	0	150	100%	0%	0%	7	6
CE4-30	Nuclear Chemical Engineering	ELECTIVE	24	126	0	150	80%	20%	0%	7	6
CE3-03-2	Fluid Mechanics	ELECTIVE	30	120	0	150	100%	0%	0%	7	6
ME3-HNUCN	Introduction to Nuclear Energy	ELECTIVE	30	120	0	150	100%	0%	0%	7	6
CE4-31	Transport Processes in Biological Systems	ELECTIVE	30	120	0	150	100%	0%	0%	7	6
CE4-15	Membrane Science & Membrane Separation Processes	ELECTIVE	30	120	0	150	100%	0%	0%	7	6

Indicative Module List

Code	Title	Core/ Elective	L&T Hours	Ind. Study Hours	Place- ment Hours	Total Hours	% Written Exam	% Course- work	% Practical	FHEQ Level	ECTS
CE3-03-3	Particle Engineering	ELECTIVE	30	120	0	150	100%	0%	0%	7	6
CE4-16	Process Heat Transfer	ELECTIVE	30	120	0	150	100%	0%	0%	7	6
CE4-32	Biochemical Engineering	ELECTIVE	30	120	0	150	100%	0%	0%	7	6
CE4-20	Pharmaceutical Process Development	ELECTIVE	30	120	0	150	100%	0%	0%	7	6
CE4-21	Modelling of Biological Systems	ELECTIVE	30	120	0	150	100%	0%	0%	7	6
CE4-08	Dynamic Behaviour in Process Systems	ELECTIVE	24	126	0	150	80%	20%	0%	7	6
CE4-27	Advanced Bioprocess Engineering	ELECTIVE	30	120	0	150	100%	0%	0%	7	6
CE4-23	Product Characterisation	ELECTIVE	30	120	0	150	75%	25%	0%	7	6
CE4-15	Colloid and Interface Science	ELECTIVE	30	120	0	150	75%	25%	0%	7	6
BS0845	Strategic Management	ELECTIVE	30	120	0	150	80%	20%	0%	7	6
BS0808	Finance and Financial Management	ELECTIVE	30	120	0	150	70%	30%	0%	7	6
BS0820	Managing Innovation	ELECTIVE	30	120	0	150	80%	20%	0%	7	6
BS0821	Project Management	ELECTIVE	30	120	0	150	0%	100%	0%	7	6

Supporting Information

The Programme Handbook is available at:

<http://www.imperial.ac.uk/engineering/departments/chemical-engineering/courses/postgraduate/msc/>

The Module Handbook is available at:

<http://www.imperial.ac.uk/engineering/departments/chemical-engineering/courses/postgraduate/msc/>

The College's entry requirements for postgraduate programmes can be found at:

www.imperial.ac.uk/study/pg/apply/requirements

The College's Quality & Enhancement Framework is available at:

www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance

The College's Academic and Examination Regulations can be found at:

<http://www3.imperial.ac.uk/registry/proceduresandregulations/regulations>

Imperial College is an independent corporation whose legal status derives from a Royal Charter granted under Letters Patent in 1907. In 2007 a Supplemental Charter and Statutes was granted by HM Queen Elizabeth II. This Supplemental Charter, which came into force on the date of the College's Centenary, 8th July 2007, established the College as a University with the name and style of "The Imperial College of Science, Technology and Medicine".

<http://www.imperial.ac.uk/admin-services/secretariat/college-governance/charters-statutes-ordinances-and-regulations/>

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<http://www.hefce.ac.uk/reg/of/>