

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 primarily intended as a reference point for academic and support staff involved in delivering the programme and enabling student development and achievement, for its assessment by internal and external examiners, and in subsequent monitoring and review.

Programme Information

Programme Title	Advanced Chemical Engineering with Process Systems Engineering				
Award(s)	MSc				
Programme Code(s)	H8C2				
Awarding Institution	Imperial College London				
Teaching Institution	Imperial College London				
Faculty	Faculty of Engineering				
Department	Department of Chemical Engineering				
Main Location of Study	South Kensington Campus				
Mode and Period of Study	1 calendar year full-time (12 months)				
Cohort Entry Points	Annually in October				
Relevant QAA Benchmark Statement(s) and/or other external reference points					
Total Credits	MSc	ECTS:	90	CATS:	180
FHEQ Level	Level 7 - Master's				
EHEA Level	2 nd cycle				
External Accrerator(s)	IChemE Accreditation received: 2016 Accreditation renewal: 2018				
Specification Details					
Student cohorts covered by specification	2019-20 entry				
Person Responsible for the specification	Dr Jason Hallett (MSc Advanced Chemical Engineering Course Co-ordinator) and Christian Addie (MSc Administrator for Advanced Chemical Engineering Programmes)				

Date of introduction of programme	
Date of programme specification/revision	April 2018
Programme Overview	
<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.</p> <p>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>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.

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

Entry Requirements

Academic Requirement	Normally a 2:1 UK Bachelor's Degree with Honours in a Physical Science, Engineering, Mathematical, or Life/Biomedical Sciences based subject (or a comparable qualification recognised by the College).
English Language Requirement	Standard requirement IELTS score of 6.5 overall (minimum 6.0 in all elements)

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"> • Blackboard • Online lectures via Panopto
Project 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

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

Re-sit Policy

In line with College policy, students who are unsuccessful in any of their examinations may usually be allowed an opportunity to re-sit at the discretion of the Board of Examiners.

Specific information regarding re-sits for Taught Master's degrees can be found in the relevant Academic Regulations available at: <https://www.imperial.ac.uk/about/governance/academic-governance/regulations/>.

Mitigating Circumstances Policy

Students may be eligible to apply for mitigation if they have suffered from serious and unforeseen circumstances during the course of their studies that have adversely affected their ability to complete an assessment task and/or their performance in a piece of assessment.

The College's Policy on Mitigating Circumstances is available at: <https://www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/>.

Assessment Dates & Deadlines

Written Examinations	January, May and June
Coursework Assessments	Continuous
Project Deadlines	Mid-September
Practical Assessments	Continuous

Assessment Structure

Marking Scheme

Pass

- Achieve a minimum aggregate mark of 50% across the core and elective taught modules;
- Achieve a minimum aggregate mark of 50% in the Research Project module;
- Achieve a minimum aggregate mark of 50% for the programme as a whole.

A student who fails to meet this requirement may be Compensated. Compensation is awarded at the discretion of the Board of Examiners and only in accordance with paragraph 14.1 of the Regulations for the Examination of Master's Level Degrees.

Merit

- Achieve a minimum aggregate mark of 60% across the core and elective taught modules;
- Achieve a minimum aggregate mark of 60% in the Research Project module;
- Achieve a minimum aggregate mark of 60% for the programme as a whole.

A student who fails to meet this requirement may be Compensated. Compensation is awarded at the discretion of the Board of Examiners and only in accordance with paragraphs 14.1 and 14.2.1 of the Regulations for the Examination of Master's Level Degrees.

Students who have failed any examination and passed on re-entry cannot be considered for the award of a Merit classification.

Distinction

- Achieve a minimum aggregate mark of 70% across the core and elective taught modules;
- Achieve a minimum aggregate mark of 70% in the Research Project module;
- Achieve a minimum aggregate mark of 70% for the programme as a whole.

A student who fails to meet this requirement may be Compensated. Compensation is awarded at the discretion of the Board of Examiners and only in accordance with paragraphs 14.1 and 14.2.1 of the Regulations for the Examination of Master's Level Degrees.

Students who have failed any examination and passed on re-entry cannot be considered for the award of a Distinction classification.

Module Weightings	
Module	% Module Weighting
Advanced Process Design	6.66%
Advanced Process Optimisation I	6.66%
Advanced Process Operations	6.66%
Dynamic Behaviour in Process Systems	6.66%
4 x elective modules	6.66% each
Research Project	46.66%

Indicative Module List

Code	Title	Core/ Elective	Year	L&T Hours	Ind. Study Hours	Place- ment Hours	Total Hours	% Written Exam	% Course- work	% Practical	FHEQ Level	ECTS
CE4-36	Advanced Process Design	CORE	1	30	120	0	150	70%	30%	0%	7	6
CE9-RES	Research Project	CORE	1	30	120	0	150	0%	90%	10%	7	42
CE4-08	Dynamic Behaviour in Process Systems	CORE	1	24	126	0	150	80%	20%	0%	7	6
CE4-06A	Advanced Process Optimisation I	CORE	1	30	120	0	150	75%	25%	0%	7	6
CE4-05	Advanced Process Operations	CORE	1	30	120	0	150	70%	30%	0%	7	6
CE4-37	Advanced Environmental Engineering	ELECTIVE	1	20	130	0	150	0%	100%	0%	7	6
CE4-28	Carbon Capture & Clean Fossil Fuels	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE4-09	Dynamical Systems in Chemical Engineering	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE3-02	Reaction Engineering 2	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE4-30	Nuclear Chemical Engineering	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE3-03-2	Fluid Mechanics	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE4-31	Transport Processes in Biological Systems	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE4-15	Membrane Science & Membrane Separation Processes	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE3-03-3	Particle Engineering	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE4-16	Process Heat Transfer	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE4-33	Molecular Modelling of Fluids	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE4-32	Biochemical Engineering	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE4-27	Advanced Bioprocess Engineering	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE4-21	Modelling of Biological Systems	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE4-17	Colloid & Interface Science	ELECTIVE	1	30	120	0	150	75%	25%	0%	7	6
CE4-20	Pharmaceutical Process Development	ELECTIVE	1	30	120	0	150	100%	0%	0%	7	6
CE4-23	Product Characterisation	ELECTIVE	1	30	120	0	150	75%	25%	0%	7	6
BS0806	Entrepreneurship Online	ELECTIVE	1	30	120	0	150	0%	80%	20%	6	6
BS0845	Strategic Management	ELECTIVE	1	30	120	0	150	80%	20%	0%	6	6

Indicative Module List

Code	Title	Core/ Elective	Year	L&T Hours	Ind. Study Hours	Place- ment Hours	Total Hours	% Written Exam	% Course- work	% Practical	FHEQ Level	ECTS
BS0808	Finance and Financial Management	ELECTIVE	1	30	120	0	150	70%	30%	0%	6	6
BS0820	Managing Innovation	ELECTIVE	1	30	120	0	150	80%	20%	0%	6	6
BS0821	Project Management	ELECTIVE	1	30	120	0	150	0%	100%	0%	6	6
BS0850	Managerial Economics Online	ELECTIVE	1	30	120	0	150	70%	30%	0%	6	6
BS0851	Corporate Finance Online	ELECTIVE	1	30	120	0	150	70%	30%	0%	6	6
BS0853	Accounting Online	ELECTIVE	1	30	120	0	150	70%	30%	0%	6	6
BS0815	Business Economics	ELECTIVE	1	30	120	0	150	60%	30%	10%	6	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:

<https://www.imperial.ac.uk/about/governance/academic-governance/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/charter-and-statutes/>

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<https://www.officeforstudents.org.uk/>