

MSc Engineering Fluid Mechanics for the Offshore, Coastal and Built Environments

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	Engineering Fluid Mechanics for the Offshore, Coastal and Built Environments			
Award(s)	MSc			
Programme code	H141 (1YFT) or H14124 (2YPT)			
Awarding Institution	Imperial College London			
Teaching Institution	Imperial College London			
Faculty	Faculty of Engineering			
Department	Department of Civil and Environmental Engineering			
Main Location of Study	South Kensington Campus			
Mode and Period of Study	Full-time: 1 calendar year (12 months) Part-time: 2 calendar years (24 months)			
Cohort Entry Points	Annually in October			
Relevant <u>QAA Benchmark Statement(s)</u> and/or other external reference points	Master's Awards in Engineering			
Total Credits	ECTS:	90	CATS:	180
<u>FHEQ Level</u>	Level 7			
<u>EHEA Level</u>	2 nd cycle			
External Accrator(s)	None			
Specification Details				
Student cohorts covered by specification	2018-19 entry			
Person Responsible for the specification	Fionnuala NiDhonnabhain PGT Courses Manager			

Date of introduction of programme	October 2017
Date of programme specification/revision	September 2018
Programme Overview	
<p>The MSc Engineering Fluid Mechanics for the Offshore, Coastal and Built Environments will educate future Engineers specialising in civil engineering fluid mechanics. The offshore, coastal and built environments represent a unique combination of areas, providing students with a well-rounded and broad knowledge of civil engineering fluid mechanics. The students will have access to the College's world-class Hydrodynamics Laboratory to perform and observe experimental investigations. This will allow students to cement principles introduced on the taught part of the programme, as well as inspiring the future crop of Engineers in Fluid Mechanics. In addition, there is a strong design component to the programme in the shape of four projects in the various topics to emphasis industry relevance. Students will also have the opportunity to undertake research with academics within the top-rated Civil & Environmental Engineering Department from REF2014 and RAE2008.</p>	
Learning Outcomes	
<p><u>Knowledge and Understanding</u></p> <ul style="list-style-type: none"> • A selection of the major topics in the subject, their recognition and underlying fundamental principles. • Research techniques which might include information retrieval, experimental design and statistics, modelling and safety. • The essential facts, concepts, principles and theories relevant to the students' chosen areas of research. • Management and communication skills, including problem definition, project design, decision processes, teamwork, written and oral reports, and scientific publications. <p><u>Intellectual/Thinking Skills</u></p> <ul style="list-style-type: none"> • Analyse and solve problems using a multidisciplinary approach, applying professional judgements to balance costs, benefits, safety and social and environmental impact. • Integrate and critically evaluate information. • Formulate and apply appropriate solutions. • Plan, conduct and write-up a programme of individual research. <p><u>Practical Skills</u></p> <ul style="list-style-type: none"> • Plan and execute safely a series of experiments and computations. • Use laboratory methods and computer-based tools to generate data. • Analyse results, determine their strength and validity, and make recommendations. • Prepare technical and design reports. • Give technical presentations. • Use the scientific literature effectively. <p><u>Transferable Skills</u></p> <ul style="list-style-type: none"> • Communicate effectively through oral presentations, computer processing and presentations, and written reports. • Apply knowledge and modelling skills. • Management skills: decision processes, objective criteria, problem definition, project design and evaluation needs. 	

- Integrate and evaluate information from a variety of sources.
- Transfer techniques and solutions from one discipline to another.
- Use Information and Communications Technology.
- Manage resources and time.
- Learn independently with open-mindedness and critical enquiry.
- 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 Honour in an engineering or science-based discipline (or a comparable qualification recognised by the College). A-Level Mathematics at grade B, or equivalent.
Additional Requirements	None

Applicants who do not meet the academic requirements above but who have substantial relevant industry experience may be admitted following successful completion of a 'Special Qualifying Exam' (SQE)

Applicants may be invited to attend a post-application interview.

English Language Requirement	Standard requirement IELTS 6.5 with a minimum of 6.0 in each element or equivalent
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The programme's competency standards documents can be found at: <http://www.imperial.ac.uk/civil-engineering/prospective-students/postgraduate-taught-admissions/>

Learning & Teaching Strategy

Scheduled Learning & Teaching Methods	<ul style="list-style-type: none"> • Lectures • Experimental demonstrations • Seminars • Case studies • Group work exercises • Formal presentations
E-learning & Blended Learning Methods	<ul style="list-style-type: none"> • Module content available on Blackboard • MapleTA
Placement Learning Methods	Students may have the opportunity to undertake their research project on an industrial placement.

Assessment Strategy

Assessment Methods	<ul style="list-style-type: none"> • Written examinations • Individual and group coursework • Design project reports • Research project report • Oral presentations
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Academic Feedback Policy

The following are the mechanisms in place for providing prompt feedback to students on their performance in coursework and examinations and processes for monitoring:

- Coursework, marked and annotated by academic staff, is given back to students within three weeks.
- Academic staff may also provide verbal feedback in class or distribute written overviews.
- Provisional feedback, in grade format, on examination/assessment performance is given to students, within 6 weeks of the January exam block and within eight weeks of the May, by the Examinations Officer.

Re-sit Policy

The College's Policy on Re-sits is available at: <http://www.imperial.ac.uk/student-records-and-data/for-current-students/undergraduate-and-taught-postgraduate/exams-assessments-and-regulations/>

Mitigating Circumstances Policy

The College's Policy on Mitigating Circumstances is available at: <http://www.imperial.ac.uk/student-records-and-data/for-current-students/undergraduate-and-taught-postgraduate/exams-assessments-and-regulations/>

Programme Structure

Full-time	Pre-session	Term One	Term Two	Term Three	Term Four
Core Modules	2	6	6	0	0
Research Project	0	0	0	1	
Part-time (Year One)	Pre-session	Term One	Term Two	Term Three	Term Four
Core Modules	2	6	0	0	0
Research Project	0	0	0	1	
Part-time (Year Two)	Pre-session	Term One	Term Two	Term Three	Term Four
Core Modules	0	0	6	0	0
Research Project	1				

Assessment Dates & Deadlines		
Written Examinations	January, May	
Coursework Assessments	Continuous	
Research Project Deadline	Mid-September	
Practical Assessments	Continuous	
Assessment Structure		
Programme Elements	ECTS	% Weighting
Coursework	30	33.3%
Examinations	30	33.3%
Research Project	30	33.3%
Total	90	100%

Marking Scheme
<p>The Board of Examiners for the Fluid Mechanics MSc cluster abide by the relevant Imperial College Policy for award of Postgraduate Taught Course Degrees.</p> <p>For the MSc in Engineering Fluid Mechanics for the Offshore, Coastal and Built Environments the assessments are grouped into three elements as follows:</p> <ol style="list-style-type: none"> 1. Coursework, and 2. Written Examinations, and 3. The Research Project. <p>Master's students are required to pass every element of their course with an aggregate mark of at least 50%.</p> <p>The Coursework and Written Examination elements are further broken down into components, based on individual modules. Modules are assessed by written examination, group/individual coursework, or a combination of these. One single mark is returned for each component (module) assessment, the pass mark for individual components is also 50%.</p> <p>Where a candidate has achieved an average of at least 50% in each of the elements, and as long as no mark is below 40% for an individual component, the Board of Examiners may condone marks between 40 and 50%.</p>

Criteria for the Award of the Degree

A Pass would normally be awarded when all the following criteria are met:

- The Coursework mark is 50% or higher
- The Written Examinations mark is 50% or higher
- The Research Project mark is 50% or higher

A Merit would normally be awarded when all the following criteria are met:

- The Coursework mark is 60% or higher
- The Written Examinations mark is 60% or higher
- The Research Project mark is 60% or higher

A Merit would normally be awarded when all the following criteria are met:

- The Coursework mark is 70% or higher
- The Written Examinations mark is 70% or higher
- The Research Project mark is 70% or higher

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
Non-assessed, Pre-session Material												
CI9-FM-00A	Mathematics Primer	Core	1	0	25	0	25	0	0	0	-	0
CI9-FM-00B	Matlab Primer	Core	1	0	25	0	25	0	0	0	-	0
Assessed Modules – Autumn and Spring Terms												
CI9-FM-01	Fluid Mechanics Fundamentals	Core	1	25	100	0	125	0	100	0	6	5
CI9-FM-02	Modelling Tools	Core	1	30	95	0	125	0	60	40	7	5
CI9-FM-03	Transport Processes	Core	1	25	100	0	125	75	25	0	7	5
CI9-FM-04	Wave Mechanics	Core	1	30	95	0	125	75	25	0	7	5
CI9-FM-05	Buoyancy-driven Flows	Core	1	30	95	0	125	75	25	0	7	5
CI9-FM-06	Air-Sea Interaction Dynamics	Core	1	30	95	0	125	75	25	0	7	5
CI9-FM-07	Computational Analysis	Core	1	25	100	0	125	0	100	0	7	5
CI9-FM-08	Fluid Loading	Core	1	30	95	0	125	75	25	0	7	5
CI9-FM-09	Coastal Processes	Core	1	30	95	0	125	75	25	0	7	5
CI9-FM-10	Energy Systems	Core	1	25	100	0	125	75	25	0	7	5

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
CI9-FM-11	Urban Fluid Mechanics	Core	1	25	100	0	125	75	25	0	7	5
CI9-FM-12	Design Projects	Core	1	20	105	0	125	0	80	20	7	5
CI9-FM-13	Research Project	Core	1	0	750	0	750	0	80	20	7	30

Code	Module	Weighting	ECTS
	Pre-Arrival		
CI9-FM-00A	Mathematics Primer	NA	0
CI9-FM-00B	Matlab Primer		0
	Autumn Term		
CI9-FM-01	Fluid Mechanics Fundamentals	5.55%	5
CI9-FM-02	Modelling Tools	5.55%	5
CI9-FM-03	Transport Processes	5.55%	5
CI9-FM-04	Wave Mechanics	5.55%	5
CI9-FM-05	Buoyancy-driven Flows	5.55%	5
CI9-FM-08	Fluid Loading	5.55%	5
	Spring Term		
CI9-FM-06	Air-Sea Interaction Dynamics	5.55%	5
CI9-FM-07	Computational Analysis	5.55%	5
CI9-FM-09	Coastal Processes	5.55%	5
CI9-FM-10	Energy Systems	5.55%	5
CI9-FM-11	Urban Fluid Mechanics	5.55%	5
CI9-FM-12	Design Projects	5.55%	5
	Summer Term		
CI9-FM-13	Research Project	33.33%	30

Supporting Information

The Programme Handbook is available at:

<http://www.imperial.ac.uk/civil-engineering/prospective-students/postgraduate-taught-admissions/fluid-mechanics-cluster/msc-engineering-fluid-mechanics/>

The Module Handbook is available at:

<http://www.imperial.ac.uk/civil-engineering/prospective-students/postgraduate-taught-admissions/fluid-mechanics-cluster/syllabus/>

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/>

Imperial College London is regulated by the Higher Education Funding Council for England (HEFCE)

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

Modifications

Description	Committee	Date	Paper
Change the module title of C19-FM-06 Experiments & Paper Review to 'Air-Sea Interaction Dynamics' and to change the assessment strategy for module C19-FM-07 Computational Analysis (to remove the written examination assessment and to increase the coursework assessment to 100%).	Programmes Committee	19 December 2017	PC.2017.22
Changes to the assessment strategy of the programme.	Programmes Committee	27 March 2018	PC.2017.48