

Programme Information		
Programme Title	Programme Code	HECoS Code
MSc Sustainable Energy Futures	H9A1	For Registry Use Only

Award	Length of Study	Mode of Study	Entry Point(s)	Total Credits	
				ECTS	CATS
MSc	12 months	Full-Time	Annually in October	90	180
PG Certificate	N/A	Full-Time	N/A	30	60

The PG Certificate is an exit award and is not available for entry. All students must apply to and join the MSc.

Ownership			
Awarding Institution	Imperial College London	Faculty	Faculty of Engineering
Teaching Institution	Imperial College London	Department	Mechanical Engineering
Associateship	N/A	Main Location(s) of Study	South Kensington Campus
External Reference			
Relevant <a href="#">QAA Benchmark Statement(s)</a> and/or other external reference points	Engineering		
<a href="#">FHEQ Level</a>	Level 7		
<a href="#">EHEA Level</a>	2nd Cycle		
External Accreditor(s) (if applicable)			
External Accreditor 1:	The Energy Institute		
Accreditation received:	2020	Accreditation renewal:	2024
Collaborative Provision			
Collaborative partner	Collaboration type	Agreement effective date	Agreement expiry date
N/A	N/A	N/A	N/A
Specification Details			
Programme Lead	Dr Fei Teng		
Student cohorts covered by specification	2022-23 entry		

Date of introduction of programme	October 07
Date of programme specification/revision	September 22

### Programme Overview

The MSc in Sustainable Energy Futures is an internationally unique programme. Throughout the year our students have lectures and guidance from experts across all research areas at Imperial College London, as well as leaders from the energy industry. The curriculum's focus on a multidisciplinary view of the energy sector means graduates are well placed to work in a diverse range of energy-related areas and are in high demand from employers. Our graduates find employment in public, private and third sector organisations - consultancies, industry, business, and government bodies worldwide, or engage in PhD research in academic institutions in the UK and abroad. Many of our graduates are head-hunted through our alumni network.

The main aim of the programme is to develop the next generation of leaders in the energy sector. This postgraduate programme provides grounding in the major features of global energy issues, sustainable energy technologies and their interactions with economics, the environment and policy. Taking a quantitative approach to the study of technology and systems, the MSc mainly, though not exclusively, attracts students from engineering and physical sciences. It also appeals to those with some post degree experience wishing to gain a broader, more strategic perspective of energy issues.

Combining the academic and industrial experience of the Faculty of Engineering with the Faculty of Natural Sciences, the Imperial College Business School, the MSc in Sustainable Energy Futures offers a unique multidisciplinary teaching programme. Emphasis is placed on the study of whole systems and sustainability in order to be directly applicable to the wide-ranging and cross-cutting energy problems faced by society. On the programme, you will develop the critical evaluation skills, research techniques and quantitative analytical methodologies essential for assessing real-world energy systems.

### Learning Outcomes

On completion of the MSc Sustainable Energy Futures programme, you will be able to:

1. Apply knowledge of global energy demand and utilisation, key energy production, storage, transmission and utilisation technologies, key energy economics, environmental and policy issues to analyse and evaluate complex energy systems.
2. Formulate complex energy problems from whole system perspective involving aspects of efficiency, risk, environmental impact, and economics quantitatively.
3. Use quantitative analysis and evaluation methods and tools for the solution of typical, practical energy systems problems
4. Analyse and solve problems using a multidisciplinary approach, applying professional judgments to balance performance, costs, benefits, safety and social and environmental impact
5. Retrieve and critically analyse basic data with appropriate tools in respect of energy sources, production, transformation and demand
6. Conduct independent research by applying techniques includes information retrieval, experiment and data analysis, modelling, economic and environmental impact assessment, and ethical aspects of research
7. Interpret state-of-the-art technical and scientific publications related to a research topic and demonstrate a critical attitude towards the results of others as well as their own.
8. Produce, as a written output, a research paper which presents in a coherent manner the aims/research content, a literature review, research methodology, research results, discussion and conclusions concisely written in the style of a scientific publication.

On completion of your studies for the PG Certificate in Sustainable Energy Futures (as an exit award), you will have achieved some of the learning outcomes 1 to 5 listed above, depending on the taught modules you have passed.

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](http://www.imperial.ac.uk/students/academic-support/graduate-attributes)

<b>Entry Requirements</b>	
Academic Requirement	<p>The minimum requirement is normally a 1<sup>st</sup> class UK Bachelor's Degree with Honours in Engineering or Natural Sciences (or a comparable qualification recognised by the College).</p> <p>For further information on entry requirements, please go to <a href="http://www.imperial.ac.uk/study/pg/apply/requirements/pgacademic">www.imperial.ac.uk/study/pg/apply/requirements/pgacademic</a></p>
Non-academic Requirements	N/A
English Language Requirement	<a href="#">Higher requirement (PG)</a>
Admissions Test/Interview	No
The programme's competency standards documents can be found at: TBA	
<b>Learning &amp; Teaching Approach</b>	
<p>Our diverse cohort of 45-50 students is drawn from a variety of engineering and science backgrounds, with typically over 20 nationalities represented. A cohesive student group is quickly developed as our modules are all compulsory, so you study all classes together throughout the taught portion of the programme. We assist this cohort building through an initial focus on communication and group working in our research and consultancy project management classes at the start of the programme. These workshops are highly interactive with significant industry input. Most modules include group projects, with the groups allocated so that, as far as possible, everyone in the cohort has the opportunity to work with each other during the programme.</p> <p>During the autumn term the programme focuses on foundation modules to provide a solid grounding for students from diverse academic backgrounds. These are delivered as a mixture of lectures and tutorials. In the tutorials you will have the opportunity to work through exercises to test your understanding and aid learning. Debates between student groups are also scheduled during the autumn term to explore current issues within the energy sector in a very interactive way and help to develop your communication skills.</p> <p>In the spring term the modules are taught in two week blocks so that you focus intensively on different aspects of the energy sector. The first week is mostly lectures from experts in their field and the second week transitions to a greater emphasis on facilitated group working sessions to support your group projects.</p> <p>You will complete a literature review in the spring term, but from the summer term you will focus exclusively on your research project. As a multidisciplinary programme you will have the opportunity to choose from projects from all departments involved in energy research at Imperial College. Many projects have industry co-supervision and you also have the option to propose your own project. The research projects are an independent piece of work. You will drive and take ownership of the project but will be supported by regular meetings with your supervisor(s) throughout the process.</p> <p><b>Overall Workload</b></p> <p>Your overall workload consists of timetabled classes, group projects and independent learning. At Imperial, each <a href="#">ECTS credit</a> taken equates to an expected total study time of 25 hours. Therefore, the expected total study time is 2250 hours per year.</p> <p>In the first two terms you will spend about 20% of your time in lectures and tutorials and the remaining 80% of your time on independent study. In the summer you will be working independently on your research project with support from your supervisor(s).</p>	
<b>Assessment Strategy</b>	
Assessment Methods	
<p>To complete the requirements of the degree, all assessments must be undertaken to the appropriate level and will include the following:</p> <ul style="list-style-type: none"> <li>• Individual and group coursework assignments</li> <li>• Debates</li> <li>• Group projects and presentations</li> <li>• Written examinations</li> </ul>	

- Literature review
- Thesis

We aim to use a range of summative and formative assessment methods to maximise student learning. Summative assessment refers to those forms of assessment set out above that will test your achievement of module objectives, allow you to demonstrate that you have met the intended learning outcomes of each module and contribute towards the programme-level intended learning outcomes. The written exams for Autumn and Spring term modules will take place in the beginning of Spring and Summer terms, respectively. To support you to identify areas of strengths and weaknesses to improve your learning, during the programme, we have a range of formative assessments such as problem-solving exercises.

The balance of the summative assessment across the programme is as follows

Taught modules (50%)		Research Project (50%)	
Coursework	55%	Coursework	90%
Exams	32%	Exams	0%
Practical	13%	Practical	10%

#### Academic Feedback Policy

The assessment of our programmes is designed to include a wide range of assessment types, including examinations, group and individual coursework assignments, essays, presentations, literature review, thesis. Feedback will be provided to you formally via methods appropriate to the assessment, as detailed below.

- Marked coursework and/or written comments are normally returned to individuals or groups within two-three weeks of submission.
- Verbal feedback sessions for individual or groups may also be provided with the opportunity to ask questions.
- The Programme Director and Module Leaders may offer office hours for additional feedback.
- Informal feedback will be provided during tutorials in relation to the group projects.
- Provisional feedback, in grade format, on examination/assessment performance in a module is given to students, normally within 6-8 weeks of the examinations (in March and July). Group feedback will be provided before the next set of examinations. The Programme Director has individual meetings with those students who have borderline performance or fail modules.
- Feedback on research projects is given throughout the period of research from regular meetings with your supervisor(s) and a written feedback summary will be provided to students individually two-three weeks after the literature review submission.

The College's Policy on Academic Feedback and guidance on issuing provisional marks to students is available at: [www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/](http://www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/)

#### Re-sit Policy

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

Additional Programme Costs		
This section should outline any additional costs relevant to this programme which are not included in students' tuition fees.		
Description	Mandatory/Optional	Approximate cost
N/A	N/A	N/A

**Important notice:** The Programme Specifications are the result of a large curriculum and pedagogy reform implemented by the Department and supported by the Learning and Teaching Strategy of Imperial College London. The modules, structure and assessments presented in this Programme Specification are correct at time of publication but might change as a result of student and staff feedback and the introduction of new or innovative approaches to teaching and learning. You will be consulted and notified in a timely manner of any changes to this document.

**Year 1 - FHEQ Level 7**  
**Students study all core and compulsory modules.**

Code	Module Title	Core/ Elective/ Compulsory	Group	Term	Credits
MECH70040	Low Carbon Technologies	Compulsory		1	5
MECH70031	Methods for the Analysis of Energy Systems	Compulsory		1	5
MECH70032	Energy Economics and Policy	Compulsory		1	5
MECH70033	Entrepreneurship Towards Zero Carbon Energy Systems	Compulsory		1	5
MECH70034	Urban Energy Systems	Compulsory		2	5
MECH70035	Synthetic Fuels	Compulsory		2	5
MECH70036	Energy Transmission and Storage	Compulsory		2	5
MECH70037	Sustainable Transport	Compulsory		2	5
MECH70038	Research Project	Core		1,2,3	45
MECH70039	Data Science and Digitalisation in the Energy Sector	Compulsory		2	5
<b>Credit Total</b>					<b>90</b>

### **Award and Classification for Postgraduate Students**

#### **Award of a Postgraduate Certificate (PG Cert)**

To qualify for the award of a postgraduate certificate a student must have a minimum of 30 credits at Level 7 (this may include a maximum of 10 credits from Level 6 where this is approved as part of the award).

#### **Award of a Postgraduate Diploma (PG Dip)**

To qualify for the award of a postgraduate diploma a student must have passed modules to the value of no fewer than 60 credits at Level 7 (this may include a maximum of 15 credits from Level 6 where this is approved as part of the award).

1. and no more than 10 credits as a Compensated Pass;

#### **Award of a Postgraduate Degree (including MRes)**

To qualify for the award of a postgraduate degree a student must have:

1. accumulated credit to the value of no fewer than 90 credits at level 7;
2. and no more than 10 credits as a Compensated Pass;
3. met any specific requirements for an award as outlined in the approved programme specification for that award.

### **Classification of Postgraduate Taught Awards**

The College sets the class of Degree that may be awarded as follows:

1. Distinction: The student has achieved an overall weighted average of 70.00% or above across the programme.
2. Merit: The student has achieved an overall weighted average of above 60.00% but less than 70.00%.
3. Pass: The student has achieved an overall weighted average of 50.00% but less than 60.00%.
  - a. For a Masters, students must normally achieve a distinction (70.00%) mark in the dissertation or designated final major project (as designated in the programme specification) in order to be awarded a distinction.
  - b. For a Masters, students must normally achieve a minimum of a merit (60.00%) mark in the dissertation or designated final major project (as designated in the programme specification) in order to be awarded a merit
  - c. Modules taken at level 6 as part of the programme specification for a named postgraduate award will contribute to the determination of pass, merit or distinction for any taught postgraduate award and are included in the calculation of the overall weighted average.

### **Programme Specific Regulations**

As an accredited degree, students on the programme are subject to the standards set by the Engineering Council in relation to compensation: a maximum of 10 ECTS credits can be compensated across the entire programme.

Supporting Information
The Programme Handbook is available at: <b>TBA</b>
The Module Handbook is available at: <b>TBA</b>
The College's entry requirements for postgraduate programmes can be found at: <a href="http://www.imperial.ac.uk/study/pg/apply/requirements">www.imperial.ac.uk/study/pg/apply/requirements</a>
The College's Quality & Enhancement Framework is available at: <a href="http://www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance">www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance</a>
The College's Academic and Examination Regulations can be found at: <a href="http://www.imperial.ac.uk/about/governance/academic-governance/regulations">www.imperial.ac.uk/about/governance/academic-governance/regulations</a>
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". <a href="http://www.imperial.ac.uk/admin-services/secretariat/college-governance/charters/">www.imperial.ac.uk/admin-services/secretariat/college-governance/charters/</a>
Imperial College London is regulated by the Office for Students (OfS) <a href="http://www.officeforstudents.org.uk/advice-and-guidance/the-register/">www.officeforstudents.org.uk/advice-and-guidance/the-register/</a>
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 prospective and current students, 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.

Modifications			
Description	Approved	Date	Paper Reference
Curriculum Review	Programmes Committee	22/03/22	PC.2021.58