

| Programme Information | | |
|---|----------------|-----------------------|
| Programme Title | Programme Code | HECoS Code |
| Mechanical Engineering with a Year Abroad | H304 | For Registry Use Only |

| Award | Length of Study | Mode of Study | Entry Point(s) | Total Credits | |
|-------|-----------------|---------------|----------------|---------------|------|
| | | | | ECTS | CATS |
| MEng | 4 Years | Full Time | N/A | 240 | 480 |

This programme is not available for entry. All students must apply to and join the Mechanical Engineering MEng and transfer from within.

Specific academic and language requirements for transferring to this programme are outlined in the Progression and Classification section at the end of this document.

| Ownership | | | |
|--|-----------------------------------|---------------------------|-------------------------|
| Awarding Institution | Imperial College London | Faculty | Faculty of Engineering |
| Teaching Institution | Imperial College London | Department | Mechanical Engineering |
| Associateship | City and Guilds Institute | Main Location(s) of Study | South Kensington Campus |
| External Reference | | | |
| Relevant QAA Benchmark Statement(s) and/or other external reference points | Honours Degree in Engineering | | |
| FHEQ Level | Level 7 - Honours | | |
| EHEA Level | 2nd Cycle | | |
| External Accreditor(s) (if applicable) | | | |
| External Accreditor: | Institute of Mechanical Engineers | | |
| Accreditation received: | 2016 | Accreditation renewal: | 2022 |
| 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 Michael J Bluck | | |
| Student cohorts covered by specification | 2022-23 entry | | |

| | |
|--|--------------|
| Date of introduction of programme | September 19 |
| Date of programme specification/revision | March 22 |

Programme Overview

The MEng Mechanical Engineering with a Year Abroad programme seeks to educate and enthuse future engineers, resulting in graduate students with expertise matched with professionalism, creativity and an international perspective. The programme consists of technical, practical and professional modules in multiples of 5 ECTS.

In the first year you will develop a basic understanding across a range of technical modules in three technical themes; solid mechanics, thermofluids and mechatronics. The realisation of the engineering product and the understanding and practice of design is introduced in the Design and Manufacture module. Mathematics and computing are vital languages in engineering and your skills are developed in support of the technical themes. An engineer must operate in a commercial environment and the professional skills module develops and equips you with the necessary understanding and experience through practice.

The second year is a continuation of the first, further developing your expertise across the three technical disciplines, design and manufacture, supporting mathematics and computing and professional skills. These two core years establish a strong technical and professional base for subsequent years.

The third year enables you to tailor the programme to your own ambitions and still establish mastery in at least one technical theme. There are clear optional learning pathways through the programme, encapsulated in the theme structure, supporting the achievement of deep understanding at level 6. The group Design, Make and Test project brings together your technical skills and develops creativity and innovation in a team-working environment, requiring you to produce reports, posters and presentations. Also in year 3, the Literature Research Project (LRP) (a component of the Professional Skills module) develops your critical analysis and report writing skills.

Year 4 is undertaken at one of a number of high-quality institutions in Australia, Singapore, USA, France, Germany, Switzerland or the Netherlands. The application process to go abroad starts in the autumn term of the 3rd year for the international exchanges and in the spring term for EU exchanges and will be initiated by the departmental exchange coordinator. Time spent abroad during your degree gives you the chance to challenge yourself personally in a different academic and cultural environment. It's also proof to employers that you're adaptable, independent and globally aware.

As a graduate of this programme you will be equipped with the skills to find solutions to real-life problems with conflicting requirements. The employment trajectories of our graduates are very diverse. Many find work in consultancy, tackling an ever-changing variety of tasks. The technical and management skills of the discipline are equally valued in the commercial world, where they work together to sharpen the competitive edge. Some of our graduates elect to remain in academia to contribute to research and the education of future generations. The degree programme is accredited by the Institution of Mechanical Engineers as the basis for Chartered Engineer status.

Learning Outcomes

On completion of year 1 (equivalent to a CertHE) you will be able to:

1. Explain the underpinning mathematics, basic mechanics, mechatronics and thermofluids associated with a career in mechanical engineering.
2. Consider how appropriate codes of practice, industry standards, quality issues and lifelong learning are applicable to a general mechanical engineering career.
3. Apply design processes and methodologies.
4. Evaluate the characteristics of engineering materials, equipment and processes and basic mechanical workshop practices.

On completion of year 2 (equivalent to a DipHE), in addition to the ILOs above you will be able to:

6. Explain advanced mathematics and knowledge of the fundamentals of mechanical, mechatronics and thermofluids associated with a career in mechanical engineering.
7. Describe, develop and use mathematical and computer models for the analysis of engineering systems.

8. Recommend and select management techniques appropriate for a career in engineering and an understanding of the commercial and economic context of the engineering business.
9. Apply advanced design processes and methodologies in a team working environment involving consideration of applicable health & safety, diversity, inclusion, cultural, societal issues.
10. Report technical ideas, results and data in a clear professional manner.

On completion of year 3 (equivalent to a BEng), in addition to the ILOs above you will be able to:

11. Research and critically evaluate concepts and evidence; apply diagnostic and creative skills and exercise significant judgement and accept accountability for determining and achieving personal and/or group outcomes.
12. Design, manufacture and test engineering devices, using creative processes, design processes, methodologies and team working.
13. Illustrate the intellectual property issues and of environmental, legal, security and ethical issues within the modern professional industrial world.
14. Construct physical and mathematical models in range of engineering subjects and evaluate and apply the analytical techniques used within at least one major engineering discipline.

On completion of year 4 (equivalent to a MEng), in addition to the ILOs above you will be able to:

15. Synthesize fundamental engineering concepts and evaluate and apply them to a complex and specialised area of engineering of industrial importance.
16. Select state-of-the-art methods in a range of engineering subjects, analyse complex data, and simulate and model relevant scenarios.
17. Conduct research, or advanced technical activity, accepting accountability for related decision making
18. Work effectively in an international setting with people who have different mechanical engineering education backgrounds, approaches or perspectives

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 | <p>A Levels A* Maths, A* Physics, A in another subject (Further Maths (3 subjects) useful but not essential).</p> <p>A Levels A* Maths, A Physics, A in two other subjects (Further (4 subjects) Maths useful but not essential).</p> <p>IB 40 overall, 6 Maths (HL), 6 Physics (HL), 6 other (HL)</p> <p>For further information on entry requirements, please go to https://www.imperial.ac.uk/study/ug/apply/requirements/ugacademic/</p> |
| Non-academic Requirements | N/A |
| English Language Requirement | <p>Standard requirement</p> <p>Please check for other Accepted English Qualifications</p> |
| Admissions Test/Interview | Where possible, shortlisted applicants are invited for interview. |

The programme's competency standards documents can be found at: https://bb.imperial.ac.uk/webapps/blackboard/content/listContent.jsp?course_id= 6309_1&content_id= 54070_8_1

Learning & Teaching Approach

Teaching

You will be taught through a combination of, lectures, tutorials, team-based learning, laboratory demonstrations, experiments, practical classes, guest lectures and presentations. Lectures make use of recording and a number of interactive technologies including experimental demonstrations. Tutorials will enable you to discuss and develop your understanding of topics covered in lectures whilst in smaller groups of around 16 students. Team-based learning is used in creative and design-oriented study and laboratory demonstrations and experiments support the theoretical knowledge developed in lectures and tutorials.

Independent learning

You are expected to spend significant time on independent study outside of face to face contact time. This will typically include accessing and interacting with resources online, reading journal articles and books, undertaking research in the library, reviewing lecture notes and watching lecture recordings, working on individual and group projects, working on coursework assignments, solving tutorial questions and revising for exams.

Where appropriate, and specifically for practical and laboratory-based modules, use is made of flipped teaching, meaning that you will need to actively engage with on-line materials ahead of attending timetabled sessions. This independent learning is followed by sessions where you will work in small groups to apply that knowledge in practice, thereby further consolidating and enhancing understanding of the topics studied.

Research projects and literature reviews

You are given numerous opportunities to consider specific problems of interest to you. In the Literature Review Project, Design, Make and Test project and Final Year Project you can select from a very broad range of projects, including technical, commercial, economic and socio-political topics (in the final year, this depends on the local institution). You can also self-propose topics, subject to agreement with the supervisor. A substantive part of the project/your study can be self-proposed across the programme.

Overall Workload

The overall workload consists of face-to-face sessions, independent and team-based learning. While actual contact hours may vary according to the optional modules students choose to study, the following gives an indication of how much time you will need to allocate to different activities at each level of the programme. At Imperial, each [ECTS credit](#) taken equates to an expected total study time of 25 hours. Therefore, the expected total study time is normally 1500 hours per year.

Typically, in the first two years (levels 4 and 5) you will spend around 20% of the time on lectures, seminars and other scheduled activity (around 300 hours) and around 80% of the time on independent study (around 1200 hours).

In the third and fourth years (level 6 and 7), you will spend less time in lectures, seminars or other scheduled activity (around 60 hours). Instead, the rest of the time will be split evenly between independent study and project work (approximately 600 hours on each).

Assessment Strategy

Assessment Methods

You can expect a variety of different types of assessment methods:

Written assessment

- Examinations
- Progress tests
- Online assignments, quizzes and tests
- Report writing
- Peer assessment

Practical assessment

- Laboratory/workshop practicals
- Programming tests
- CAD & simulation tool tests

Oral assessment

- Oral presentations
- Poster presentations
- Group presentations
- Design exhibitions

The programme allows you to test understanding of the subject informally before you complete the formal summative assessments that count towards your final mark. These summative assessments allow you to demonstrate that you have met the intended learning outcomes for each module and contribute towards your achievement of the programme learning outcomes, detailed above. There is formal summative assessment during and/or at the end of each module. Examinations are intended to assess understanding rather than recall. Group assessments may incorporate peer marking. Note that the assessments in the final year are subject to the rules of the local institution and marks are mapped onto the programme according to established rules.

Balance of assessment

The percentages below are based on a typical pathway through the course and have been rounded to the nearest whole number.

| | Year 1 | Year 2 | Year 3 | Year 4 |
|-------------|--------|--------|--------|--------|
| Coursework | 20% | 20% | 40% | 45% |
| Practical | 5% | 5% | 5% | 5% |
| Examination | 75% | 75% | 55% | 50% |

Academic Feedback Policy

Feedback is provided through a number of formats, including:

- Oral (e.g. face to face during or after face-to-face sessions, video)
- Personal (e.g. discussion with staff)
- Interactive (e.g. Team Based Learning, peer-to-peer, online quizzes)
- Written (e.g. solutions, model answers, comments on work which can be used as feedforward)

You will receive feedback on intermediate, developmental assessments such as project plan and progress reports and on coursework assessments. Feedback on examination performance is available upon request from the module leader and overall class performance feedback on a question-by-question basis is also provided. Feedback is intended to help you learn and you are encouraged to discuss it with your module tutor. Feedback will be provided on coursework and practical assessments within 2 weeks of 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/

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/

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/

Additional Programme Costs

This section should outline any additional costs relevant to this programme which are not included in students' tuition fees.

Students will need to consider the costs involved with placements. For students studying or working abroad as part of their programme, costs will vary with destination. Information on the types of costs which may be incurred can be found in the Placements Abroad Handbook which is available at <https://www.imperial.ac.uk/placements/information-for-imperial-college-students/>

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.

| Programme Structure ¹ | | | | | |
|---|-----------------------------------|-------------------|--------|-------|---------|
| Year 1 – FHEQ Level 4 Students study all core modules. | | | | | |
| Code | Module Title | Core/ Elective | Group* | Term | Credits |
| MECH40008 | Mathematics and Computing 1 | Core | N/A | 1,2 | 15 |
| MECH40001 | Professional Engineering Skills 1 | Core | N/A | 1,2 | 5 |
| MECH40005 | Stress Analysis 1 | Core | N/A | 1,2,3 | 5 |
| MECH40009 | Mechanics | Core | N/A | 1,2,3 | 5 |
| MECH40006 | Materials 1 | Core | N/A | 1,2,3 | 5 |
| MECH40002 | Fluid Mechanics 1 | Core | N/A | 1,2,3 | 5 |
| MECH40003 | Thermodynamics 1 | Core | N/A | 1,2,3 | 5 |
| MECH40004 | Mechatronics 1 | Core | N/A | 1,2,3 | 5 |
| MECH40007 | Design and Manufacture 1 | Core | N/A | 1,2,3 | 10 |
| Credit Total | | | | | 60 |
| Year 2 - FHEQ Level 5 Students study all core modules. | | | | | |
| Code | Module Title | Core/ Elective | Group | Term | Credits |
| MECH50003 | Mathematics and Computing 2 | Core | N/A | 1,2 | 10 |
| MECH50007 | Professional Engineering Skills 2 | Core | N/A | 1,2 | 5 |
| MECH50002 | Stress Analysis 2 | Core | N/A | 1,2,3 | 5 |
| MECH50008 | Dynamics | Core | N/A | 1,2,3 | 5 |
| MECH50005 | Materials 2 | Core | N/A | 1,2,3 | 5 |
| MECH50010 | Fluid Mechanics 2 | Core | N/A | 1,2,3 | 5 |
| MECH50006 | Thermodynamics 2 | Core | N/A | 1,2,3 | 5 |
| MECH50001 | Heat Transfer | Core | N/A | 1,2,3 | 5 |
| MECH50004 | Mechatronics 2 | Core | N/A | 1,2,3 | 5 |
| MECH50009 | Design and Manufacture 2 | Core | N/A | 1,2,3 | 10 |
| Credit Total | | | | | 60 |

¹ **Core** modules are those which serve a fundamental role within the curriculum, and for which achievement of the credits for that module is essential for the achievement of the target award. Core modules must therefore be taken and passed in order to achieve that named award. **Compulsory** modules are those which are designated as necessary to be taken as part of the programme syllabus. Compulsory modules can be compensated. **Elective** modules are those which are in the same subject area as the field of study and are offered to students in order to offer an element of choice in the curriculum and from which students are able to select. Elective modules can be compensated.

Year 3 - FHEQ Level 6

Students must study all core modules and one compulsory I-Explore module (F). Students must study both modules in at least one of groups A-C, and three additional modules from groups A-E. Note that no more than two modules can be studied from group E overall. Note that a range of electives are available in a given year and students will be given advance notice of which options are available to them ahead of making module choices.

| Code | Module Title | Core/ Elective | Group | Term | Credits |
|--------------|---|-------------------|-------|----------|---------|
| MECH60015 | Professional Engineering Skills 3 | Core | N/A | 1,2 | 10 |
| MECH60003 | Design, Make and Test Project | Core | N/A | 1,2,3 | 20 |
| | I-Explore (Level 5/6) | Compulsory | F | 1 &/or 2 | 5 |
| MECH60014 | Stress Analysis 3A | Elective | A | 1,2 | 5 |
| MECH60002 | Fracture Mechanics A | Elective | A | 1,2 | 5 |
| MECH60011 | Thermodynamics 3A | Elective | B | 1,2 | 5 |
| MECH60006 | Fluid Mechanics 3A | Elective | B | 1,2 | 5 |
| MECH60018 | Mechatronics 3A | Elective | C | 1,2 | 5 |
| MECH60001 | Machine Dynamics and Vibrations A | Elective | C | 1,2 | 5 |
| MECH60009 | Embedded C for Microcontrollers A | Elective | D | 1,2 | 5 |
| MECH60013 | Structure, Properties and Application of Polymers A | Elective | D | 1,2 | 5 |
| MECH60021 | Computational Continuum Mechanics A | Elective | D | 1 | 5 |
| MECH60007 | Finite Element Analysis and Applications A | Elective | D | 1,2 | 5 |
| MECH60005 | Manufacturing Technology and Management A | Elective | D | 1,2 | 5 |
| MECH60004 | Introduction to Nuclear Energy A | Elective | D | 1 | 5 |
| MECH60019 | Tribology A | Elective | D | 1,2 | 5 |
| MECH60016 | Mathematics A | Elective | D | 1,2 | 5 |
| MECH60017 | Statistics A | Elective | D | 1,2 | 5 |
| MECH60024 | Automotive Design with Motorsport | Elective | D | 1 | 5 |
| MECH60025 | Equality, Diversity and Inclusion in Engineering A | Elective | D | 1 | 5 |
| | BPES Modules | Elective | E | 1 &/or 2 | 5 |
| Credit Total | | | | | 60 |

Year 4 - FHEQ Level 7

Students must follow the agreed pathway at the overseas institution

| Code | Module Title | Core/ Elective | Group | Term | Credits |
|-----------|--------------|-------------------|-------|-------|---------|
| MECH70028 | Year Abroad | Core | N/A | 1,2,3 | 60 |

* 'Group' refers to module grouping (e.g. a group of electives from which one/two module(s) must be chosen).

Transferring to the Year Abroad Programme

All students must apply to and join the Mechanical Engineering MEng. The application process to go abroad starts in the autumn term of Year Three for the international exchanges and in the spring term for EU exchanges and will be initiated by the departmental exchange coordinator.

You will need to demonstrate that you hold the required language level, based on the following:

- i) Where the host institution teaches exclusively in English or you do not need to pass examinations in the foreign language, B1 (level 3), is acceptable.
- ii) Where you attend a combination of lectures in English and the target language, B2 (level 4) is required.
- iii) Where you need to follow lectures and/or seminars exclusively in the target language, B2/C1 (level 5) is required.

Therefore, you should consider attending language classes in Years One and Two at the Centre for Languages, Culture and Communications (CLCC).

Details of language classes and description of the language levels can be found on the Imperial Languages webpages here: <http://www.imperial.ac.uk/languages/>

Full details will be provided in your Student Handbook.

Progression

Requirements for progression between years of study and for classifications of degrees are provided in the Academic Regulations.

If a candidate fails any core modules at the first attempt, the Examining Board may, against criteria determined on a year by year basis, record a Deferred Decision and require a reassessment(s).

A maximum of 15 ECTS credits can be compensated across the entire programme. You must have a minimum overall grade of 65.00% on completion of Year Three to transfer to the Year Abroad Programme.

The Year Abroad cannot be compensated.

Classification

The marks from modules in each year contribute towards the final degree classification.

In order to be considered for an award, students must have achieved the minimum number of credits at the required levels prescribed for that award and met any programme specific requirements as set out in the Programme Specification.

Classification will be determined through:

- i) Aggregate Module marks for all modules
- ii) Year Weightings

For this award, Year One is weighted at 7.50%, Year Two at 20.00%, Year Three at 36.25% and Year Four at 36.25%.

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

- i) First 70.00% or above for the average weighted module results
- ii) Upper Second 60.00% or above for the average weighted module results
- iii) Lower Second 50.00% or above for the average weighted module results
- iv) Third 40.00% or above for the average weighted module results

Please find the full Academic Regulations at <https://www.imperial.ac.uk/about/governance/academic-governance/regulations/>. Please follow the prompts to find the set of regulations relevant to your programme of study.

Programme Specific Regulations

As an accredited degree, students on the MEng programme are subject to the standards set by the Engineering Council in relation to compensation: a maximum of 15 ECTS credits can be compensated across the entire programme.

Policies and regulations may vary for students on a year abroad. You are encouraged to familiarise yourself with the relevant policies and regulations which will underpin your studies while abroad before you go. If you have any questions, please talk to your host institution or your home departmental contact.

Supporting Information

The Programme Handbook is available at: N/A

The Module Handbook is available at: N/A

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:
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".
www.imperial.ac.uk/admin-services/secretariat/college-governance/charters/

Imperial College London is regulated by the Office for Students (OfS)
www.officeforstudents.org.uk/advice-and-guidance/the-register/

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 |
|-------------|----------|------|-----------------|
| N/A | N/A | N/A | N/A |