

Programme Information		
Programme Titles	Programme Code	HECoS Code
Design Engineering Design with Behaviour Science	H902 H903	For Registry Use Only

Award	Length of Study	Mode of Study	Entry Point(s)	Total Credits	
				ECTS	CATS
MSc	1 Calendar Year (12 months)	Full-Time	Annually in October	90	180
PG Diploma*	N/A	N/A	N/A	60	120
PG Certificate*	N/A	N/A	N/A	30	60

*The PG Diploma/Certificate are exit awards and not available for entry. You must apply to and join the MSc.

Exit awards are available in Design Engineering and Design with Behaviour Science. The title is determined by the Board of Examiners based on the successfully completed core and compulsory modules.

Ownership			
Awarding Institution	Imperial College London	Faculty	Faculty of Engineering
Teaching Institution	Imperial College London	Department	Dyson School of Design Engineering
Associateship	Diploma of Imperial College (DIC)	Main Location(s) of Study	South Kensington Campus

External Reference	
Relevant QAA Benchmark Statement(s) and/or other external reference points	Master's Awards in Engineering Master's Awards in Mathematics, Statistics and Operational Research
FHEQ Level	7
EHEA Level	2nd Cycle

External Accreditor(s) (if applicable)			
External Accreditor 1:	N/A		
Accreditation received:	N/A	Accreditation renewal:	N/A

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 Shayan Sharifi
Student cohorts covered by specification	2024-25 entry
Date of introduction of programme	October 24
Date of programme specification/revision	May 23

Programme Overview
<p>This transdisciplinary degree programme has been designed to equip the next generation of technical innovators with the mindsets and tools of Design Engineers – to support the development of creative and rigorous solutions that have a positive impact on the world.</p> <p>As part of the broader community at the Dyson School of Design Engineering (the School), the programme connects those with a technical background in a learning environment developed for those passionate about building solutions and grasping opportunities. This action-focused approach aims to build transformational change with engineering and scientific rigour.</p> <p>The taught Master’s programme builds on the cultural and disciplinary melting pot of academics and students at the School to provide an opportunity to pivot your existing skill set from a Science, Technology or Engineering degree towards an applied, innovative, and practically oriented design-led skill set. It is based at the intersection of design practice with emerging technologies, scientific grounding, user insights, and contextual application. Here, a transdisciplinary approach allows for knowledge generation that goes beyond existing disciplines; integrating a diverse set of academic and non-academic stakeholders.</p> <p>Through learning the tools of design, you will learn to gather insights about users and contexts, make sense of complex information, find opportunities for intervention, and develop solutions to tackle the hierarchy of design engineering challenges including performance, systemic, societal and global challenges. You will also critically learn to explore concepts, build your ideas, and test them in the real world to develop impactful human-centred outputs. The tools of designers are used across every sector and allow for seeing things from different perspectives, solving problems in new ways, and identifying novel opportunities. Design skills are useful across several employment sectors, such as technological innovation, banking and finance, government, medical and scientific research, and the digital economy.</p> <p>The programme has two streams, each with its own specialisms to focus on specific aspects of design practice:</p> <ul style="list-style-type: none"> • Design Engineering – This programme stream will provide you with an enhanced background in engineering or related fields with advanced skills and knowledge in design methods, systems thinking, innovation, and entrepreneurship through a range of project-based learning modules including those linked to the industry and administered by the programme staff or generated by students, which will produce engineers who are able to understand the needs of users in their context, identify opportunities, solve problems creatively, assess the impact of the proposed solutions through user testing, and take their solution from the early stages of design right through to the market. To this end, the programme has a particularly strong focus on the communication and translation of engineering in the world today. • Design with Behaviour Science – Understanding human behaviour is critical in the development of effective products and strategies. In this programme stream, you will explore how to incorporate theory, research and practices in behaviour science into the design of positive outcomes. This will involve learning to understand, develop, and monitor behavioural design interventions through gathering design-led insights and using design-led tools, developing an in-depth understanding of users in their context, and honing your ability to integrate knowledge across disciplines.

In addition to obtaining advanced knowledge across a range of subjects encompassing design, these programme streams will equip you with a range of transferable skills, including user analytics, methodological and analytical skills, problem-solving, design exploration, prototyping and testing ideas, project work and presentation skills. Graduates can therefore go on to take on roles at the forefront of innovation in a wide array of sectors, including but not limited to roles in Design Research and Strategy, Innovation Management and Technical Design Lead at companies such as consultancies, financial institutions, manufacturers, start-ups and large technology companies.

The School staff, consisting of a balance of research academics, practitioners and teaching fellows, cover the very broad range of curriculum content, ranging from psychology to materials science. Through our taught programmes and research activity, the School maintains strong links with all scales of industry and across many sectors. The distinctive Dyson Building of Design Engineering provides a consolidated home for a very wide range of external engagement activities including an annual showcase of work to industry and the public. The School is proud of nurturing a strong student-staff culture.

A mapping of the programme stream curricula is shown in Figure 1 below. The programme begins in the Autumn term with core modules that will introduce you to the key skills and methods of a design engineer, exploring how to synthesise scientific knowledge and skills into impactful human-centred solutions. As you move into the Spring term you will be able to deepen your core skills whilst also selecting from a range of elective subjects (from Robotics to Games Theory) to allow you to develop expertise in areas related most closely to your interests. In the Summer you will focus on your Master's project, which provides a substantial opportunity for self-directed working and developing an in-depth design project to cultivate your new interests and practices in design engineering.

Master's projects can be generated by the supervisor or yourself (with the support of an academic supervisor), with these advertised in the second half of the Autumn term. Here you will rank your project preferences from the list of supervisor-generated projects and write a short statement of motivation (unless you already have an agreed self-generated project with academic supervisor and module lead support). Project allocation will then be done by the module lead, based on maximising top preferences, information provided in supporting statements and academic loading.

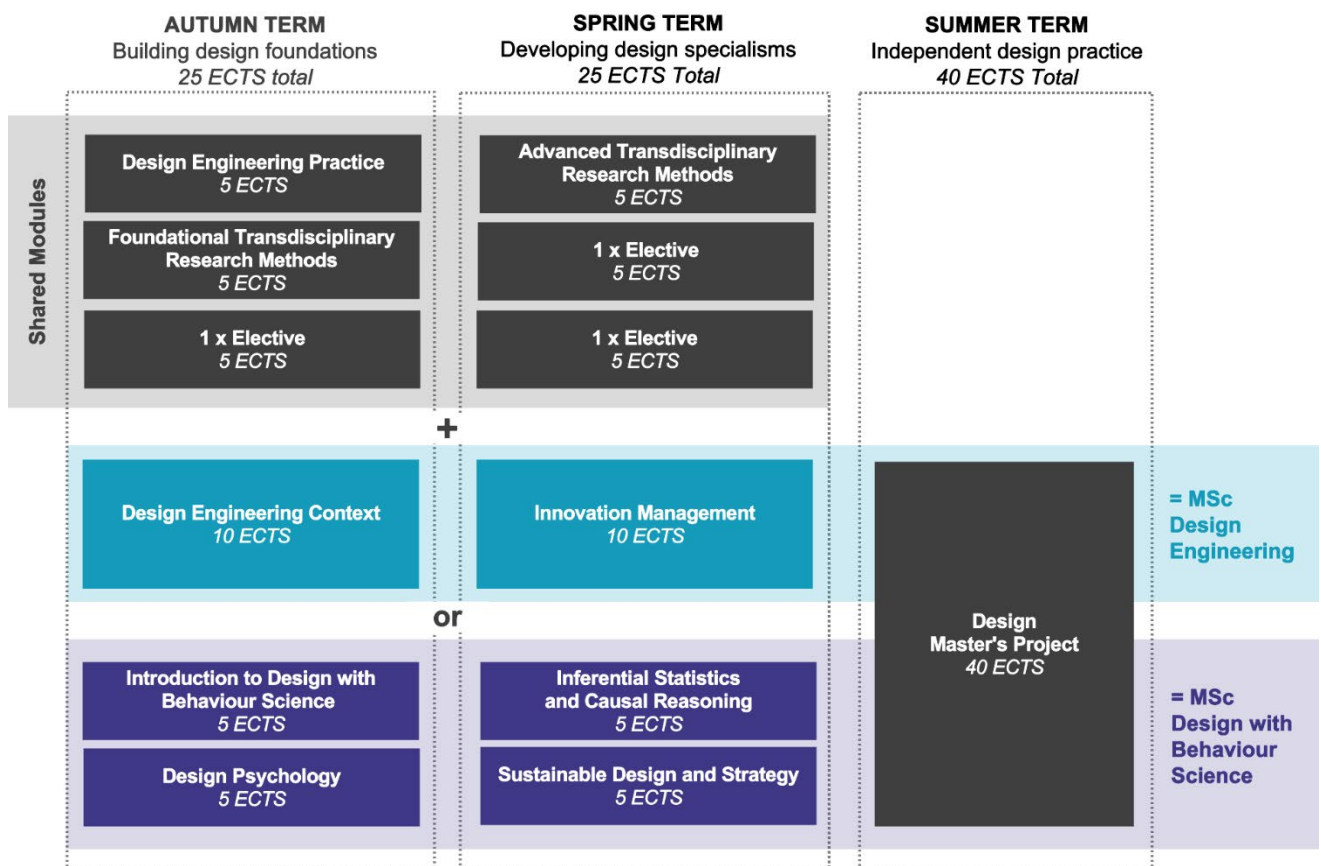


Figure 1. Curriculum Map

Learning Outcomes

Upon successful completion of the programme, you will be able to:

1. *Design Engineering Methods*: Select appropriate design engineering processes, methods, techniques, tools, and user research and apply them with high levels of skill and creativity.
2. *Contextual Evaluation & Impact Analysis*: Develop strategies to evaluate contexts and systems that are complex or ambiguous calculate, measure, and monitor the impact of design work across scales.
3. *Design Engineering Mindset*: Synthesise new knowledge, understanding, and skills in effective ways to develop strategies for working with uncertainty and ambiguity.
4. *Communications*: Communicate effectively using a range of media directed to a variety of relevant stakeholders.
5. *Team Working*: Demonstrate individual responsibilities of managing and contributing in effective and diverse teams.
6. *Professional Identity*: Reflect on personal development to define an evolving individual skill set, professional identity, and context of operation.

In addition to learning outcomes 1-6, on completion of the MSc in Design Engineering programme stream you will be able to:

7. *Integrated Design Engineering*: Employ an integrated design engineering approach to diverse scenarios including systems design and engineering, and design engineering processes.
8. *Creativity & Design*: Integrate principles and methodologies of creativity within a diverse range of design engineering projects to achieve distinctive outcomes.
9. *Prototyping*: Build prototypes of innovative products, services, and systems that enable effective evaluation, iteration, and communication.
10. *Enterprise*: Apply methodologies and methods in innovation, entrepreneurship, business, and project management in relation to design engineering.

In addition to learning outcomes 1-6, on completion of the MSc in Design with Behaviour Science programme stream you will be able to:

7. *Behaviour Science*: Analyse and apply social and behavioural science principles to develop human-centred design processes and outcomes.
8. *Quantitative Analytical Skills*: Evaluate, compare, and justify analytical methods, as well as apply and interpret statistical results to solve impactful problems.
9. *Qualitative Analytical Skills*: Gather, interpret, and synthesise findings from primary and secondary research, identify strengths and weaknesses of different approaches and apply them appropriately.
10. *Research Design*: Design and develop rigorous design and research processes for gathering a range of human insights.

Students exiting with a PG Certificate will have accomplished at least learning outcomes 1, 3, and 4.

Students exiting with a PG Diploma will have accomplished at least learning outcomes 1, 2, 3, 4 and 5.

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

The minimum requirement is normally equivalent to a First-class UK Bachelor's Degree with Honours in a Science, Technology and Engineering discipline (or a comparable qualification recognised by the College). In some circumstances, we may also accept those with a 2:1 equivalent if you have substantial (more than 2 years) professional experience or further studies in a related area.

For further information on entry requirements, please go to:

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

Non-academic Requirements	<p>For the MSc in Design Engineering, candidates must also have:</p> <ul style="list-style-type: none"> • Two academic references. • A multimedia portfolio of past projects, e.g. webpages, folios, or recorded demos (A guideline on what should be included in a project portfolio is provided on the webpage of the programme). <p>For the MSc in Design with Behaviour Science, candidates must also have:</p> <ul style="list-style-type: none"> • Two references evidencing the student's analytical skills (e.g. academic references citing modules studied, and/or professional references citing applied examples in previous work experience). • A written statement articulating motivation and suitability for the degree.
English Language Requirement	<p>Higher requirement (PG) Please check for other Accepted English Qualifications</p>
Admissions Test/Interview	<p>Candidates who are shortlisted will be invited to attend an interview with an Academic member of staff. This will normally be conducted remotely online.</p>

The programme's competency standards documents are available from the department.

Learning & Teaching Approach

Learning and Teaching Delivery Methods

The School places a strong emphasis on professionally relevant, project-based learning. Students also attend lectures and access online learning resources to support knowledge acquisition. Knowledge, intellectual and practical skills relating to our diverse curriculum are developed within a planned sequence of modules and are developed through a variety of learning formats. Primarily through project-based learning, but supported with intensive skills development sessions in workshops, studios and labs, group and individual tutorials, group working, and a variety of presentation and peer review formats.

Typical class sizes will range from 20-90 students and will involve the following:

- *Authentic project-based learning (APBL)*: You will work on engaging real-world projects based on core, industrially relevant challenges, potentially collaborating with industrial partners, and using a range of Design Engineering process methodologies.
- *Team-Based Working*: You will work in teams to support your knowledge acquisition in dynamic and challenging transdisciplinary projects with multiple types of interactions, which will include Peer Review.
- *Technology Enhanced Learning*: All core module and programme materials are available via Blackboard. You will have direct access to an extensive range of specialist software (Matlab, Solidworks, Adobe CC etc.) and online learning opportunities through College.
- *Presentations*: Multiple formats integrating verbal, visual, video and physical artefact content to build your communication skills to a wide audience, and support assessment.
- *Workshops and labs*: You will have facilitated access to relevant workshops, as well as tutor and self-directed work in support of APBL across a wide range of facilities upon passing all the required safety training and inductions.
- *Lectures*: Talks to deliver key content for modules, including input from a range of external speakers and experts from the College, providing overviews of key concepts and facilitating learning. Typically lectures are given to the whole cohort.
- *Guest lectures*: Curated talks by external experts from diverse real-world organisations, monitored for relevance and depth by module leaders
- *Tutorials*: Group and individual formats to support APBL, understanding and skills development. Tutorials can take place both individually (such as with a personal tutor or project supervisor), or in groups (such as during project work, workshops or peer development).

- *Immersive experiences*: Visits or immersive experiences (e.g. Sprints / Hackathons) at real-world organisation
- *Independent Study*: All modules involve an aspect of individual and team-based study time to develop work and ideas.

Overall Workload

Your overall workload consists of face-to-face sessions and independent learning. While your actual contact hours may vary according to the elective modules you 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 2,250 hours per year. Typically, in the first two terms of the programme you will spend in the order of 20% of your time on lectures, seminars and similar, and in the order of 80% of your time on independent study. In the final terms, independent study time will increase as you focus on your Master's Project.

During the first two terms, you will have both core and compulsory modules, and the opportunity to select from a range of elective modules to allow you to pursue your personal interests and develop your skills. The contact hours, class sizes, methods of assessment, and types of learning will vary depending on the elective subjects taken. During the summer term, you will work on your Master's Project. You will be meeting regularly with your project supervisor to support you in progressing your work and ideas.

Assessment Strategy

Assessment Methods

The programme uses a wide range of assessment methods with an emphasis on professionally relevant practice and the project-based mode of study. Assessment methods are carefully mapped to the intended learning outcomes of any given module with the goal of always using the most efficient and authentic approach to assessing how learning outcomes are met. The balance of assessment methods varies depending on the Elective subjects chosen, but is approximately 13% Examination, 68% Coursework and 19% Practical.

Coursework components are defined as those having (physical or digital) submissions allowed until a deadline. Practical components take place during a timetabled session with a submission and/or assessment during the session, such as presentations or lab exercises. Examinations take place under exam conditions with an invigilator present. More information on assessment types can be found on the [College website](#).

Assessment methods adopted by the programme are summarised as follows:

- *Project Presentations*: Oral and visual presentations (e.g., with slides and videos) as a means of demonstrating meeting a wide range of outcomes.
- *Project Artefact*: For example, physical and digital prototype deliverables from projects are used to directly evaluate physical and intellectual skill-based outcomes.
- *Demonstrations & Exhibitions*: To validate and showcase project outputs to wider audiences to demonstrate synthesis of a wide range of intended outcomes.
- *Peer assessment of group working*: Used wherever there is a substantial team or group aspect of work to evaluate how well team working outcomes are met.
- *Visual reports, technical reports and essays*: Various formats for reporting based on authenticity in relation to the assignment and to synthesis assessment of a wide range of learning outcomes.
- *Lab books, online project records, lo-fi prototyping and sketchbooks*: Used as evidence for assessment within APBL to evaluate meeting learning outcomes related to understanding & management.
- *Online progress tests*: Used selectively as a basis for formative and summative evaluation and feedback on learning progress in relation to knowledge and understanding outcomes.
- *Written examinations*: Used selectively to demonstrate achieving learning outcomes in relation to knowledge and understanding.

In addition to summative assessment points (assessment with grades counting towards a final degree classification), you will have opportunities to receive initial, indicative (i.e. formative) assessment and feedback on your work. This type of feedback is designed to help you improve and does not count towards your grades or progression. During formative feedback points, we expect you to keep notes of comments and verbal

feedback, providing aid to reflective learning. Informal feedback may also occur in peer reviews and on an ad-hoc basis with a range of visiting tutors from the wider college or industry. Most of the project-based formative and summative assessment formats are a basis for you to progressively develop important understanding, skills and attitudes as an integral part of your learning.

Academic Feedback Policy

The School adheres to the policies and principles for academic feedback provided by the College.

Academic feedback to students

At module level, overall assessment arrangements are published to students from the start of the module. This information includes a detailed breakdown of assessment criteria, mapping to module learning outcomes and indicative criteria grade descriptors.

Feedback may be provided in one of several formats, including:

- *Verbal*: For example, during a lecture or as part of a group discussion or a presentation a staff member may give verbal feedback and advice.
- *Written*: For example, a staff member may send feedback in writing after the submission of a piece of coursework or practical demonstration.
- *Personal*: For example, through one-to-one discussions with personal tutors or project supervisors.
- *Interactive*: For example, within tutorials, workshops and study groups working alongside peers and staff members.

Summative assessments include a proportion of independent marking as a means of safeguarding and assuring academic standards, as determined by College policy. Provisional assessment results and feedback are returned to students within 10 working days unless students are notified in advance of an extended assessment period.

Student feedback to staff

Students have a variety of feedback mechanisms to discuss the quality of the learning and teaching experience, through termly surveys, open programme forums and their course representatives. This informs quality enhancement within the School.

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/about/governance/academic-governance/academic-policy/exams-and-assessment/

Mitigating Circumstances Policy

The College's Policy on Mitigating Circumstances is available at:

www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/

Additional Programme Costs

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

<i>Description</i>	<i>Mandatory/Optional</i>	<i>Approximate cost</i>
Equipment, Materials and Books (modules with a practical component will usually involve a workshop budget to support physical building costs)	Optional	£200-£1000
Laptops and Software (a number of laptops are provided by the School with all relevant software)	Optional	£500-£1500

Programme Structure¹**MSc in Design Engineering – FHEQ Level 7**

You will study all core and compulsory modules, and then select one elective from the list below in the Autumn term and two electives in the Spring term from any of the electives in groups A & B. In the Spring term, a maximum of one elective at FHEQ Level 6 may be taken in lieu of an FHEQ Level 7 elective.

Code	Module Title	Core/ Compulsory/ Elective	Term	Credits
DESE71009	Design Engineering Practice	Compulsory	Autumn	5
DESE71010	Foundational Transdisciplinary Research Methods	Compulsory	Autumn	5
DESE71011	Design Engineering in Context	Core	Autumn	10
DESE71012	Advanced Transdisciplinary Research Methods	Compulsory	Spring	5
DESE71013	Innovation Management	Core	Spring	10
DESE71014	Design Master's Project	Core	Summer	40
Credit Total				75

MSc in Design with Behaviour Science – FHEQ Level 7

You will study all core and compulsory modules, and then select one elective from the list below in the Autumn term and two electives in the Spring term. In the Spring term, a maximum of one elective from Group B at FHEQ Level 6 may be taken in lieu of an FHEQ Level 7 elective.

Code	Module Title	Core/ Compulsory/ Elective	Term	Credits
DESE71009	Design Engineering Practice	Compulsory	Autumn	5
DESE71010	Foundational Transdisciplinary Research Methods	Compulsory	Autumn	5
DESE71015	Introduction to Design with Behaviour Science	Core	Autumn	5
DESE71016	Design Psychology	Core	Autumn	5
DESE71012	Advanced Transdisciplinary Research Methods	Compulsory	Spring	5
DESE71017	Inferential Statistics and Causal Reasoning	Core	Spring	5
DESE71018	Sustainable Design and Strategy	Core	Spring	5
DESE71014	Design Master's Project	Core	Summer	40
Credit Total				75

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.

Electives

Electives are divided into two groups where Group A contains modules focussed largely on engineering and technology, and Group B contains modules focussed largely on human-centered working and behaviour science. Students on both programmes can select one elective in the Autumn term and two electives in the Spring term. Students on MSc in Design Engineering can select any electives from Group A or B. Students on MSc in Design with Behaviour Science can only select electives from Group B. Students can only select a maximum of one elective from FHEQ Level 6.

Code	Module Title	Core/ Compulsory/ Elective	Group	Term	FHEQ Level	Credits
DESE71016	Design Psychology	Elective	A	Autumn	7	5
DESE70006	Design Analytics for the Sharing Economy	Elective	B	Autumn	7	5
DESE71007	Distributed Ledger Technologies	Elective	A	Autumn	7	5
DESE71006	From Data to Product	Elective	B	Autumn	7	5
DESE70005	Nano Design Engineering	Elective	A	Autumn	7	5
DESE70007	Responsible Engineering and Design Innovation	Elective	B	Autumn	7	5
DESE71002	Robotics Research Projects	Elective	A	Autumn	7	5
DESE71003	Sensing and Internet of Things	Elective	A	Autumn	7	5
DESE71005	Transformational Play	Elective	B	Autumn	7	5
DESE71019	Modelling and Simulation	Elective	A	Autumn	7	5
DESE71020	Design for Additive Manufacturing	Elective	A	Spring	7	5
DESE71004	Design of Visual Systems	Elective	B	Spring	7	5
DESE71017	Inferential Statistics and Causal Reasoning	Elective	A	Spring	7	5
DESE71018	Sustainable Design and Strategy	Elective	A	Spring	7	5
DESE61001	Advanced Industrial Design	Elective	B	Spring	6	5
DESE61003	Audio Experience Design	Elective	B	Spring	6	5
DESE60006	Designing Interventions for Behaviour Change	Elective	B	Spring	6	5
DESE60011	Economics and Finance for Systems Design	Elective	B	Spring	6	5
DESE61008	Games and Mechanisms	Elective	B	Spring	6	5
DESE60010	Machine Learning for Design Engineers	Elective	A	Spring	6	5
Credit Total						0–15

Progression and Classification

Award and Classification for Postgraduate Students

Award of a Postgraduate Certificate (PG Cert)

To qualify for the award of a postgraduate certificate you must have:

1. Accumulated a minimum of 30 credits (of which no more than 5 credits may be at Level 6).

Award of a Postgraduate Diploma (PG Dip)

To qualify for the award of a postgraduate diploma you must have:

1. accumulated a minimum of 60 credits (of which no more than 5 credits may be at Level 6).
2. and no more than 10 credits as a Compensated Pass.

Award of a Masters Degree (MSc)

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

1. accumulated a minimum of 90 credits (of which no more than 5 credits may be at Level 6);
2. and no more than 15 credits as a Compensated Pass.

Classification of Postgraduate Taught Awards

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

1. Distinction: 70.00% or above.
 2. Merit: 60.00% or above but less than 70.00%.
 3. Pass: 50.00% or above but less than 60.00%.
- a. For a Master's degree, your classification will be determined through the Programme Overall Weighted Average meeting the threshold for the relevant classification band.
 - b. Modules taken at level 6 will contribute to the determination of pass, merit or distinction, and are included in the calculation of the overall weighted average.

Your degree algorithm provides an appropriate and reliable summary of your performance against the programme learning outcomes. It reflects the design, delivery, and structure of your programme without unduly over-emphasising particular aspects.

Programme Specific Regulations

N/A

Supporting Information

The Programme Handbook is available from the department.

The Module Handbook is available at from the department.

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

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 were 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 you may reasonably be expected to achieve and demonstrate if you full advantage of the learning opportunities provided. This programme specification is primarily intended as a reference point for prospective and current students, and 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.