Imperial College London

Programme Information		
Programme Title	Programme Code	HECoS Code
Computing	G5U6	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 Certificate and PG Diploma are exit awards and are not available for entry. You must apply to and join the MSc.					

Ownership			
Awarding Institution	Imperial College London	Faculty	Faculty of Engineering
Teaching Institution	Imperial College London	Department	Computing
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		QAA subject benchmark statement for computing. www.qaa.ac.uk/quality-code/subject-benchmark-statements/computing	
FHEQ Level		Level 7 – Master's	
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 Anandha Gopalan
Student cohorts covered by specification	2023-24 entry
Date of introduction of programme	Pre-1990
Date of programme specification/revision	August 2023

Programme Overview

The MSc Computing degree is a conversion MSc for graduates of disciplines other than Computing who wish to train as experts in Computing. After graduation, students will be qualified to move onto PhD programmes in Computing or to undertake work in Computing-related industries. This programme was introduced more than 30 years ago to address the need for highly qualified Computing experts and the need for providing opportunities for those whose first degree is not in Computing. It has undergone many changes through time but has continued to be one of the most popular and successful programmes in the Department. About 50-100 students undertake the degree programme each year.

The programme is full time and is taken over 12 months, with a single entry-point per year in October. The first term (autumn term, October-December) focuses on the fundamentals, builds a good foundation, and introduces key concepts. The second term (spring term, January-March) provides the opportunity for both depth and breadth and for specialisation. In the third term (summer term, May-September) you will undertake a major individual project, culminating in a dissertation and oral presentation.

Your studies will officially begin in the autumn term with modules specifically designed for this degree providing intensive training in programming and fundamentals of Computing. The compulsory first-term modules include Principles and Practice of Programming, and Computer Systems. Another compulsory module – Software Systems Engineering, spread over the first two terms, introduces fundamental technologies for designing and building modern software systems, including networking and distributed systems, web services and technologies, databases and continuous delivery methods. You will apply these technologies and techniques in a group project to design, develop and reliably deploy a software system. You will be sent some pre-sessional materials before you begin the programme in the autumn term. These materials will help prepare you especially for the Principles and Practice of Programming module.

In addition, the programme provides elective modules that you can select depending on your background, interest and objectives. In the autumn term you can choose between Logic and Mathematics for Computing and one of a number of modules from a list. This list currently contains modules such as Advanced Computer Architecture, Computational Finance, and Scheduling and Resource Allocation. This list is subject to change at any point depending on the availability of staff and resources at the time. If you do not have much of a background in logic or mathematics but are interested in taking a logic-based AI or a machine learning module in the spring term, then you may want to consider taking the Logic and Mathematics for Computing module. On the other hand, if you already have strong STEM degree you can opt for one of the other modules offered as elective in the autumn term. You can also do one of these as well as the Logic and Mathematics for Computing module.

In the spring term, alongside continuing the Software Systems Engineering module, you will choose a number of electives from an extensive list. Currently the list contains modules such as Algorithms, Software Engineering Design, Computer Networks and Distributed Systems, Introduction to Machine Learning, Computer Vision, Graphics, Advanced Graphics, Network and Web Security, and Cryptography Engineering. This list is subject to change depending on the availability of staff and resources. The degree also includes an opportunity to hone entrepreneurial skills, focused on AI, in an elective module called AI Ventures shared with Imperial College's Business School. You are expected to take a total of 5 electives across two terms.

The programme is structured to support and develop students with a diverse range of non-computing undergraduate degrees. Each module offers a variety of skills development. We have designed these modules to impart a broad range of the skills required by modern computing experts. The assessment will support the development of these skills through working individually, in pairs and in groups. These experiences will enhance your communication, leadership and interpersonal skills as well as your technical competence, time and project management skills. All modules have a component of continuous assessment with feedback with some having written/oral examinations, presentation with Q&A and laboratory-based coursework.

You will be taught by leading academic staff who are experts in their fields, and whose research has been recognised to be at the forefront of current advances in many branches of Computing. The teaching is also well-recognised to be informed by this research. The programme is delivered in the world-leading Department of Computing at Imperial College London. The Department has active research groups in Artificial Intelligence, Data Science, Visual Computing, Robotics, Programming Languages, Security, Systems, Theory and Algorithms. There are many collaborations with other departments at Imperial, as well as with industry. We also house dedicated research centres, including the Dyson Robotics Lab, the Data Science Institute, the Centre for Integrative Systems Biology and Bioinformatics, the Hamlyn Centre for Medical Image Computing and Robotics, and more.

Throughout the year, leading companies also visit the department to give presentations on the Applications of Computing in Industry. These are on a broad range of industrially-relevant topics including AI, Data Science, Programming Languages, Natural Language Processing and Software Engineering. We pride ourselves in presenting great opportunities to learn about the relevance and application of what you are studying, and speak directly with people working on industrial applications. We also have dedicated extracurricular tutorials and seminars on computing from guest speakers.

Graduates of the MSc Computing have progressed to PhD positions in the UK and internationally, as well as to positions in a variety of tech and finance companies.

Usually, software packages required to undertake this degree programme are accessible to all students through the department's laboratories and College's Software Hub. However, you may need to purchase personalised hardware/software tools to cater for your individual preferences and project(s). We use digital technology to bring further benefits to our education programmes, drawing from investments made and skills gained during the pandemic. We deliver our education as a useful blend of face-to-face and digital learning. This will also prepare our students well for a more hybrid work culture of the future.

Learning Outcomes

On successful completion of the MSc degree in Computing, you will be able to:

On achieving the PG Certificate, at least half of Learning Outcomes 1–7 below:

1 Articulate, evaluate and implement frequently used logical and mathematical constructs as well as data structures in a variety of programming languages to a high standard and for a range of computing applications.
2 Apply sound principles of software design techniques and follow widely used software development and testing methodologies.
3 Recommend algorithms, software tools and computing techniques most suitable for solving required problems.
4 Appraise the latest advances in computing technologies, such as databases, networks and web technologies.
5 Evaluate and critically analyse state-of-the-art technologies in modern Computing
6 Design and implement complex software solutions using state-of-the-art technologies in modern Computing with due regards to societal needs and human factors such as accessibility and inclusivity.
7 Establish teams and demonstrate relevant soft skills to work and communicate effectively within a team.

On achieving the PG Diploma, at least half of Learning Outcomes 1–7 above, and:
8 Plan and produce an independent piece of original research within a defined timeframe that demonstrates unique contribution to knowledge in an area of Computing with due regards to research ethics and sustainable practices.
9 Interpret and synthesise information from a range of technical and scientific publications related to a research topic and demonstrate a critical attitude towards the results of others as well as your own.

On achieving the MSc, Learning Outcomes 1–9 above, and:

10 Produce a written output that presents in a coherent manner the aims, objectives, relevant literature, methodology, results, discussion and conclusions of the research, concisely written in the style of a research dissertation.
11 Communicate the outcomes of the project effectively in an oral presentation and defend the research under critical questioning.

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 non-computing First Class Honours degree from UK (or an equivalent overseas qualification) with sufficient quantitative or analytical elements and a demonstrable background / motivation for this conversion degree programme. This requirement ensures an ideal amount of preparedness to complete the MSc. Applicants with a lesser qualification but with several years of relevant experience may be considered on a case-by-case basis. *For further information on postgraduate entry requirements, please check:* www.imperial.ac.uk/study/apply/postgraduate-taught/entry-requirements/
Non-academic Requirements	N/A
English Language Requirement	Higher requirement (PG) Please check for other Accepted English Qualifications using: www.imperial.ac.uk/study/apply/english-language/
Admissions Test/Interview	There are normally no admissions tests or interviews.

The programme's competency standards documents can be found at: www.imperial.ac.uk/computing/prospective-students/courses/competence/

Learning & Teaching Approach

Teaching
You will be taught through a combination of interactive sessions, lectures, team-based learning, tutorials, computer laboratory sessions, guest lectures, and individual project meetings.

Module lecturers employ a variety of these teaching methods, depending on the content of the module. A typical module might combine teaching by lectures, with tutorial sessions supported by the lecturer and their tutorial assistants. Tutorial sessions can involve practical coding tasks (run in our extensive computer laboratories), written exercises, or discussion groups.

Assessed coursework
Most modules set assessed coursework. This is sometimes to be completed in groups, and sometimes individually. It may consist of practical coding tasks, or written exercises, or a combination of the two. The portion of a module's final grade determined by assessed coursework is typically 20%, except for a few modules where it ranges from 30% to 100%.

Individual project
The degree includes a substantial individual research project, which runs from mid-May to mid-September. The research project can be conducted with academics in the Department of Computing, or within other departments at Imperial College. Some students also elect to do a research project in collaboration with industry or external research institutes, jointly supervised by an academic in the Department of Computing.

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

Overall Workload

Your overall workload consists of face-to-face sessions and independent learning. While your actual contact hours may vary according to the 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 2250 hours.

Typically, you will spend in the order of 20% of your time on lectures, tutorials, and similar; and in the order of 80% of your time on independent study.

Assessment Strategy

Assessment Methods

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

Written assessment
- Coursework exercises
- Reports on practical coding
- Short-form written answers
- Essays
- Written examinations
- Report writing
- Peer assessment reports

Programming
- Programming coursework (for taught modules)
- Programming examination
- Code repositories (for individual/group courseworks and projects)

Oral assessment
- Oral presentations with Q&A and/or viva-voce

The programme allows you to test your understanding of the subject informally — through formative tutorial exercises, coding tasks, quizzes, in-class discussion, and so on — 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.

Balance of assessment:

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

Assessed coursework	20%
Examinations (practical and written)	36%
Individual project	44%

Academic Feedback Policy

We will follow the procedures of all our other taught programmes. The department operates in accordance with the College policy on academic feedback.

Feedback will normally be provided on coursework within two weeks of submission. This will be in the form of, for example:

1. Marked-up coursework, laboratory exercises or tests
2. Personal discussion
3. Discussions in small-group tutorials

4   Verbal presentation, e.g. during or after lectures
5   Written class-wide summaries

Usually the feedback on coursework, pedagogically formative in nature, is returned electronically through department's online platform.

Feedback on exams is provided in two forms: (i) numerically, as individual interim marks subject to ratification (approval) by the Board of Examiners; and (ii) in written form, as non-individual summary feedback on individual questions. In July you will also receive feedback on which degree grade (Pass, Merit, Distinction) you are on track for. Further, selected examination questions are routinely set as unassessed or assessed problems in later years, with model answers provided. Feedback on formative exercises may be given verbally during tutorial classes, or in lectures as worked-through exercises or comments.
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

One resit is allowed per module, usually in the next instance when that module is examined. Determinations of results and mitigations will follow college policies and the academic regulations.

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.

Description	Mandatory/Optional	Approximate cost
Personalised hardware/software tools to cater for individual preferences and project(s).	Optional	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.

Programme Structure[1]					

FHEQ Level 7
In addition to the Core and Compulsory modules, you must choose 5 elective modules. You may choose:
- **1 elective from Group S1 or Group S2, and 4 electives from Group S3, or**
- **1 elective from Group S1, 1 elective from Group S2, and 3 electives from Group S3.**

Code	Module Title	Core/ Compulsory/ Elective	Group	Term	Credits
COMP70081	MSc Computing Individual Project	Core		Summer	40
COMP70083	Principles and Practice of Programming	Compulsory		Autumn	10
COMP70088	Computer Systems	Compulsory		Autumn	5
COMP70085	Software Systems Engineering	Compulsory		Autumn-Spring	10
COMP70092	Logic and Mathematics for Computing	Elective	S1	Autumn	5
COMP70086	Advanced Computer Architecture	Elective	S2	Autumn	5
COMP70006	Computational Finance	Elective	S2	Autumn	5
COMP70068	Scheduling and Resource Allocation	Elective	S2	Autumn	5
COMP70040	Databases	Elective	S3	Spring	5
COMP70089	Computer Vision	Elective	S3	Spring	5
COMP70090	Graphics	Elective	S3	Spring	5
COMP70091	Introduction to Machine Learning	Elective	S3	Spring	5
COMP70093	Logic-Based Learning (not running in 2023-24)	Elective	S3	Spring	5
COMP70082	Network and Web Security	Elective	S3	Spring	5
COMP70001	Advanced Computer Graphics	Elective	S3	Spring	5
COMP70009	Cryptography Engineering	Elective	S3	Spring	5
COMP70019	Probabilistic Inference (not running in 2023-24)	Elective	S3	Spring	5
COMP70041	Computer Networks and Distributed Systems	Elective	S3	Spring	5
COMP70094	Software Engineering Design	Elective	S3	Spring	5
COMP70087	Algorithms	Elective	S3	Spring	5
COMP70017	Principles of Distributed Ledgers	Elective	S2	Autumn	5

[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 schievement 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.

COMP70021	Quantum Computing	Elective	S3	Spring	5
BUSI70233	AI Ventures	Elective	S3	Spring	5
				Credit Total	90

Progression and Classification

Award of a Postgraduate Certificate (PG Cert)
To qualify for the award of a postgraduate certificate you must have:
1. accumulated credit to the value of no fewer than 30 ECTS credits at Level 7 or above.

Award of a Postgraduate Diploma (PG Dip)
To qualify for the award of a postgraduate diploma you must have:
1. accumulated credit to the value of no fewer than 60 ECTS credits at Level 7 or above;
2. no more than 10 credits as a result of compensated passes.

Award of a Masters Degree
To qualify for the award of a postgraduate degree you must have:
1. accumulated credit to the value of no fewer than 90 ECTS credits at level 7 or above;
2. no more than 15 credits as a result of compensated passes;
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:
- Distinction: 70.00% or above.
- Merit: 60.00% or above but less than 70.00%.
- Pass: 50.00% or above but less than 60.00%.

For a Masters, your classification will be determined through the Programme Overall Weighted Average and the designated dissertation or final major project module meeting the threshold for the relevant classification band.

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 from the department
The College's entry requirements for postgraduate programmes can be found at: www.imperial.ac.uk/study/apply/postgraduate-taught/entry-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 you may reasonably be expected to achieve and demonstrate if you take 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.