Programme Information		
Programme Title	Programme Code	HECoS Code
Advanced Computing	G5UO	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: 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 Robert Craven
Student cohorts covered by specification	2025-26 entry
Date of introduction of programme	Pre 2000
Date of programme specification/revision	October 2025

Programme Overview

The MSc in Advanced Computing is a well-established degree aimed at students who have a substantial background in computing, and who want to study advanced computing concepts and technologies in more depth.

The degree enables graduates to develop and master skills in a broad range of advanced computing concepts and technologies. Participants are given liberty to tailor the programme to their own needs and interest whilst engaging in modules delivered by world-renowned subject experts. Modules range from blockchain to quantum computing, from formal program analysis to artificial intelligence and machine learning. It is expected that the modules build upon knowledge gained in a good first degree in computer science. The expectation of graduates is that this course enables them to have rewarding careers in computing or in a profession that has computing as a core component. About 50 students undertake the degree programme each year.

The programme is taken over 12 months, full-time, with a single entry point per year in October. In the Autumn and Spring terms, timetable permitting, you will study modules from a very large range (approximately 20 per term) of taught electives. This high level of choice will allow you to extend and deepen your knowledge in the areas of computing that fit best with your individual background and interests. To further enhance the flexibility and research proximity of the programme, you will have the option of replacing one taught elective with the Independent Study Option (ISO) module. The ISO, which is only available on the MSc programme, involves individual study of an advanced topic selected by you, under the supervision of a member of staff, culminating in a written report and presentation. The remainder of the degree, from May to September, is devoted to a major individual project, resulting in a written dissertation and oral presentation. The Individual project selection allows you to meet with supervisors proposing the projects and then make an informed decision. The projects are proposed on our internal system and students can see them and accordingly select them before meeting the supervisors to discuss the projects with them.

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 computer science. 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 leading research groups in Programming Languages, Artificial Intelligence, Software Engineering, Data Science, Theory and Algorithms and Visual Computing. Many groups and members of our research staff are at the forefront of research in their respective fields: 56% of the research in the Department of Computing ranked at 4*, for “Quality that is world-leading in terms of originality, significance and rigour” in the last Research Excellence Framework exercise. The department has many collaborations with other faculties at Imperial, and leading international institutions, 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. You will be sent some pre-sessional material as necessary to help you get started. In terms of selecting the electives, you have the choice to attend the initial lectures before making your choice much later.

Graduates of the MSc in Advanced Computing have gone on to work in leading companies such as Microsoft, Amazon, DeepMind, Facebook, Google, and Twitter; many have also progressed to PhD research at Imperial and elsewhere. A graduate of the department recently had his company valued at $1 billion, and two other graduates sold their AI startup to Twitter for $150 million.

Throughout the year, leading companies 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 opportunity 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.

Usually, software packages required to undertake this degree programme are accessible to all students through the department's laboratories and Imperial'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

Upon successful completion of the programme you will have acquired the following abilities.

On achieving the PG Certificate:

1. To translate abstract and mathematical concepts into computer-based solutions for practical problems;
2. To effectively use state-of-the-art computing tools and techniques;
3. To develop and test software solutions to computational problems using a variety of programming languages and paradigms.

On achieving the PG Diploma, ILOs 1-3 above, and:

4. To apply mathematical methods and scientific reasoning to novel computing-related problems;
5. To design and engineer solutions to advanced computational problems using knowledge of multiple specialist areas of computer science and engineering;
6. To plan and conduct a programme of original research and software development;
7. To communicate effectively through technical oral presentations and written reports.

On achieving the MSc, ILOs 1-7 above, and:

8. To develop computer-based systems in a manner that respects relevant legal, social, ethical and other professional practices;
9. To adapt, integrate and transfer methods and skills between established fields and emerging trends in computing;
10. To organise and successfully implement study of advanced research level information, from diverse sources, both within instructor-led and research-based educational settings;
11. To devise and conduct practical experiments in order to push the boundaries of understanding in computer science and its application across disciplines.

The Imperial Graduate Attributes are a set of core competencies which we expect students to achieve through completion of any Imperial degree programme. The Graduate Attributes are available at: www.imperial.ac.uk/about/education/our-graduates/

Entry Requirements

Academic Requirement	1st class honours in a subject with a substantial computing component. This requirement ensures an ideal amount of preparedness to complete the MSc
Non-academic Requirements	N/A
English Language Requirement	Higher requirement (PG) Please check for other Accepted English Qualifications
Admissions Test/Interview	N/A

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 in 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 individual. It may consist of practical coding tasks, or written exercises, or a combination of the two. The portion of a module's final grade which is determined by assessed coursework is normally 20% but can be up to 100%, depending on the assessment strategy employed.

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

It may be possible for projects to be carried out partly or wholly at an external organisation and requests will be considered on a case-by-case basis.

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 the individual project, 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 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 2250 hours.

Typically, you will spend in the order of 12.5% of your time on lectures, tutorials, and similar; and in the order of 87.5% 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

Oral assessment
- Oral presentations

Modules provide a range of formative activities to allow you to test and develop your understanding of the subject, and the ways you are expected to demonstrate the intended learning outcomes, before you complete the summative assessments that count towards your final mark. Formative activities include tutorial exercises, coding

tasks, quizzes, and worked in-class problems supported by discussion. There is summative assessment during and/or at the end of each module. Summative assessments demonstrate that you have met the intended learning outcomes for each module and contribute towards your achievement of the programme learning outcomes, detailed above.

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	10%
Examinations (practical and written)	40%
Individual project	50%

Academic Feedback Policy

Feedback on formative exercises may be given in various forms. Automatic testing is commonly provided for programming exercises, both as files that you can run in a development environment and through the department's online pre-submission testing system. For both programming exercises and written problems, model solutions are commonly provided after the work is submitted. These can be used for self-assessment but will also be the subject of in-class group discussion. More individualised discussion is available during tutorial sessions and via online forums for each module.

For summative work, the department operates in accordance with Imperial's policy on academic feedback, and procedures are consistent across all taught Computing programmes. 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

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 in the form of provisional marks for taught modules. Further, selected examination questions are routinely set as formative and/or summative assessments in later years, with model answers provided.

Imperial'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 on the next occasion that the module is examined. Determinations of results and mitigating circumstances will follow Imperial's policies and the academic regulations.

Imperial's Policy on Re-sits is available at: www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/

Mitigating Circumstances Policy

Imperial'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.

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 **You will study 9 electives plus the (core) individual project.**					
Code	Module Title	Core/ Compulsory/ Elective	Group	Term	Credits
COMP70073	MSc Advanced Computing Individual Project	Core	-	Summer	45
COMP70004	Advanced Computer Security	Elective	-	Spring	5
COMP70005	Complexity	Elective	-	Autumn	5
COMP70006	Computational Finance	Elective	-	Autumn	5
COMP70015	Mathematics for Machine Learning	Elective	-	Autumn	5
COMP70018	Privacy Engineering	Elective	-	Autumn	5
COMP70020	Program Analysis	Elective	-	Spring	5
COMP70022	Scalable Systems and Data	Elective	-	Autumn	5
COMP70023	Scalable Software Verification	Elective	-	Autumn	5
COMP70028	Reinforcement Learning	Elective	-	Autumn	5
COMP70074	Prolog (not running in 2025-26)	Elective	-	Autumn	5
COMP70050	Introduction to Machine Learning	Elective	-	Autumn	5
COMP70068	Scheduling and Resource Allocation	Elective	-	Autumn	5
COMP70072	Independent Study Option	Elective	-	Spring	5
COMP70021	Quantum Computing	Elective	-	Autumn	5
COMP70001	Advanced Computer Graphics	Elective	-	Spring	5
COMP70007	Computational Optimisation	Elective	-	Spring	5
COMP70009	Cryptography Engineering (not running in 25/26)	Elective	-	Spring	5
COMP70010	Deep Learning	Elective	-	Spring	5
COMP70014	Machine Learning for Imaging	Elective	-	Spring	5
COMP70016	Natural Language Processing	Elective	-	Spring	5
COMP70017	Principles of Distributed Ledgers	Elective	-	Autumn	5

[1] **Core** modules are those which serve a fundamental role within the curriculum, and for which achievement of the credits for that mod5ule is essential for the achievement of the target award. Core modules must therefore be taken and passed in order to achieve that named a5ward. **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.

COMP70019	Probabilistic Inference	Elective	-	Spring	5
COMP70024	Software Reliability	Elective	-	Autumn	5
COMP70025	Software Engineering for Industry	Elective	-	Autumn	5
COMP70030	Knowledge Representation (not running in 2025-26)	Elective	-	Spring	5
COMP70031	Formal Methods for Safe AI	Elective	-	Spring	5
COMP70067	Robot Learning	Elective	-	Spring	5
COMP70086	Advanced Computer Architecture	Elective	-	Autumn	5
COMP70110	Computer Vision	Elective	-	Autumn	5
COMP70090	Graphics	Elective	-	Spring	5
COMP70070	Custom Computing	Elective	-	Spring	5
COMP70071	Distributed Algorithms (not running in 25-26)	Elective	-	Spring	5
COMP70082	Network and Web Security	Elective	-	Spring	5
COMP70075	System Performance Engineering	Elective	-	Spring	5
COMP70093	Logic-Based Learning	Elective	-	Spring	5
COMP70100	Computational Neurodynamics	Elective	-	Autumn	5
COMP70105	Deep Graph-Based Learning	Elective	-	Spring	5
COMP70101	Human-Robot Interaction (not running in 2025-26)	Elective	-	Autumn	5
COMP70098	Introduction to Concrete Complexity	Elective	-	Spring	5
COMP70103	Statistical Information Theory	Elective	-	Autumn	5
COMP70111	Networked Systems	Elective	-	Autumn	5
COMP70112	Non-Euclidean Methods in Machine Learning	Elective	-	Spring	5
COMP70102	Software Engineering for Machine Learning Systems	Elective	-	Spring	5
COMP70114	Machine Learning Systems and Hardware	Elective	-	Autumn	5
COMP70113	Generative AI	Elective	-	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 university 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 weighted taught module 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.
Imperial's entry requirements for postgraduate programmes can be found at: www.imperial.ac.uk/study/apply/postgraduate-taught/entry-requirements/
Imperial's Quality & Enhancement Framework is available at: www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance
Imperial's Academic and Examination Regulations can be found at: www.imperial.ac.uk/about/governance/academic-governance/regulations
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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.