Programme Information		
Programme Title	Programme Code	HECoS Code
Mathematics and Computer Science	GG41	For Registry Use Only

Award	Length of Study	Mode of Study	Entry Point(s)	Total Credits	
				ECTS	CATS
MEng	4 Academic years	Full-Time	Annually in October	270	480
BEng	3 Academic years	Full-Time	None (exit award only)	150	360
DipHE	2 Academic Years	Full-Time	None (exit award only)	120	240
CertHE	1 Academic Year	Full-Time	None (exit award only)	60	120

Ownership			
Awarding Institution	Imperial College London	Faculty	Faculty of Engineering Faculty of Natural Sciences
Teaching Institution	Imperial College London	Department	Computing Mathematics
Associateship	City and Guilds of London Institute (ACGI)	Main Location(s) of Study	South Kensington Campus
External Reference			
Relevant QAA Benchmark Statement(s) and/or other external reference points		http://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-computing-16.pdf	
FHEQ Level		Level 7	
EHEA Level		2nd Cycle	
External Accreditor(s) (if applicable)			
External Accreditor 1:	IET (Institution of Engineering and Technology)		
Accreditation received:	2017	Accreditation renewal:	2021
External Accreditor 2:	BCS (the Chartered Institute for IT)		
Accreditation received:	2017	Accreditation renewal:	2021
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 Herbert Wiklicky
Student cohorts covered by specification	2020-21
Date of introduction of programme	September 2019
Date of programme specification/revision	December 2020

Programme Overview

With the spread of computing procedures and mathematical ideas into many areas, there is high demand for professionals who are expert in both. Our Mathematics and Computer Science degrees are mathematical courses orientated towards computing science.

Taught jointly by the Departments of Computing and Mathematics, these programmes provide:

- a firm foundation in mathematics, particularly in pure mathematics, numerical analysis and statistics; and
- all the essentials of computer science, with an emphasis on developing software, as well as more theoretical topics.

This makes the courses particularly suited to mathematically-able students with interests in both subjects.

During the first two years you will take core modules from both departments and complete project work, with the chance to choose from a range of elective modules in the second year[1]. In the third and fourth year you can choose from a wide variety of elective modules offered by the departments to suit your interests. Between year three and year four you have the opportunity to gain practical experience while on a full-time industrial placement. You will also complete a substantial individual project in either of the two departments.

About the departments

In the Department of Computing we place special emphasis on the fundamental principles underlying computing and on understanding the engineering considerations involved in computing system design, implementation and usage.

In the Department of Mathematics our teaching programme is strongly influenced by their research expertise which spans Applied Mathematics and Mathematical Physics, Mathematical Finance, Pure Mathematics and Statistics.

BEng vs MEng

The department offers both a three-year BEng programme and four-year integrated Master's MEng programme in Computing. Both degree programmes involve substantial group and individual project work. The MEng

[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.

programme has the added benefit of an industrial placement, and in your final year of your programme you will be able to choose from a range of Master's level elective modules and gain further exposure to cutting-edge research problems in computing.

Benefits of accreditation

The MEng programme is professionally accredited by the IET (Institution of Engineering and Technology) and the BCS (the Chartered Institute for IT).

Achieving a professionally accredited integrated Master's degree (MEng) means that you have satisfied the first step to becoming a Chartered Engineer (CEng) in your chosen field by satisfying the educational requirements of professional registration. To gain Chartered status, you will need to demonstrate your ability to meet additional graduate level competences described in the Engineering Council's UK-SPEC

A CEng is a highly respected qualification earned by professionals working in engineering, which can lead to higher earning potential and better career prospects.

Professional registration also brings international recognition of your qualification, which is particularly useful for students preparing for a career abroad

Learning Outcomes

Upon successful completion of year 1 (equivalent to a Cert HE) you will be able to:

1. Explain the basic operation of a computer.
2. Develop and test software solutions to well-specified problems using a variety of programming paradigms.
3. Describe the key characteristics of information systems and use such systems effectively for data storage and retrieval.
4. Use mathematical methods to specify and analyse the behaviour of simple programs.
5. Appreciate the fundamentals of Mathematics as a living discipline in its own right.
6. Take a structured mathematical-analytical approach to problem solving, including the importance of assumptions made and consequences of their violation.
7. Apply basic research methods and communicate findings orally.
8. Explain the social, ethical and professional principles associated with computer-based technology and act in a manner that respects those principles.

Upon successful completion of year 2 (equivalent to a Dip HE), in addition to the ILOs above, you will be able to:

9. Apply software engineering design principles to development of robust software that is easy to understand, test and maintain.
10. Design, implement and deploy web-based applications that meet the needs of their target users.
11. Specify, design and implement programming languages.
12. Explain the key principles underpinning the design of modern computer and communication systems.
13. Apply mathematics as a language to describe and model a wide range of situations relevant to research or industry, choosing appropriate solution methods and interpreting results.
14. Take a structured mathematical-analytical approach to problem solving, including the importance of assumptions made and consequences of their violation.
15. Adhere to relevant laws that impact on the practice of computing.

Upon successful completion of the year 3, in addition to all the ILOs above, you will be able to:

16. Design, engineer and extend complex computer-based systems that are fit for purpose using core Computing knowledge and appropriate state-of-the-art technology, methods and thinking.
17. Develop computer-based systems in a manner that respects relevant legal, social, ethical and other professional practices.
18. Select and apply appropriate methods, techniques and tools to ensure correctness, security, reliability, performance, and maintainability of computer-based systems.
19. Apply mathematical methods and scientific reasoning to novel computing-related problems.

20. Communicate mathematical concepts and understanding concisely and appropriately in varied situations and to diverse audiences.
21. Demonstrate effective teamwork in the management and delivery of complex projects.
22. Communicate effectively, both orally and in writing, as individuals and as part of a team.

Upon successful completion of the MEng, in addition to all the ILOs above, you will be able to:

23. Apply technical knowledge and expertise to cutting-edge problems in industry.
24. Demonstrate in-depth understanding of various areas of mathematics through advanced guided study as well as independent research.
25. Reflect critically on professional practice in an industrial setting.
26. Use cutting-edge research, methods and thinking to solve complex Computing problems in scientific, engineering and industrial domains, as an individual.

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	Admissions are handled by the Department of Computing. **A-levels** Our typical A-level offer is A*A*A or A*A*AA including A*s in Maths and Further Maths. Typical offers also require STEP I/II/III. For further recommendations on A-levels, see **our website** under Qualification Advice for Joint Maths and Computing. We also accept the Edexcel International A levels. **International Baccalaureate** Our typical IB offer is 42 points overall with a 7 in Maths at higher level and a 7 in one further relevant subject at higher level. Typical offers also require STEP I/II/III. For further information on entry requirements, please go to https://www.imperial.ac.uk/study/ug/apply/requirements/ugacademic/
Non-academic Requirements	N/A
English Language Requirement	Standard requirement Please check for other Accepted English Qualifications
Admissions Test/Interview	All students are required to take an online admissions test that can be sat at various times throughout the admissions cycle. Applicants who are shortlisted will be invited for interview. This will normally be held at Imperial College, although there is provision for interviews to be conducted online.

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

Learning & Teaching Approach

Teaching
You will be taught through a combination of lectures, small-group and class-based tutorials, practical laboratory sessions and personal supervision of project work.

The first two years of the programme is made up of core modules. In year 1 the programming and various mathematics modules are backed up with small group tutorials in groups of approximately eight students. A senior undergraduate student will act an assistant tutor for many of these tutorials.

The third and fourth years comprise a mixture of compulsory and elective taught modules. In the third year you will also undertake a group project where you will develop a complex application as part of a team of around six students. The ability to work effectively in teams is an essential skill for any aspiring engineer and Computing is no exception.

In the fourth year you will undertake a substantial individual project under the supervision of a member of staff. These require you to use the skills you have learnt to develop a novel piece of software, hardware or theory, often related to a topical research problem in Computing.

There is a spine of professional and transferable skills throughout the four years which includes training in oral and written communication skills and group working, and exposure to important ethical and legal frameworks that will help to govern your activities as a practicing engineer.

The teaching methods will vary from standard classroom teaching to more active learning, where much of what you learn will be by small-group discussions and in-class problem-solving.

Independent learning
You will be expected to spend significant time on independent study outside of face to face contact time. This will typically include reading journal articles and books, undertaking research on-line and in the library, reviewing lecture notes and watching lecture recordings, working on individual and group projects, working on coursework assignments and revising for exams. There is also a programme of extra-curricular lectures delivered by guest speakers from industry designed to introduce you to some of the key technical challenges in Computing that are being faced by industry.

Industrial placement
In the third year you will undertake a major industrial placement that lasts for four months, beginning at the end of Summer Maths exams and ending prior to the start of the fourth year. This is a formative exercise designed to give you vital experience of working as part of a team in an industrial setting.

Overall Workload
Your overall workload consists of face-to-face sessions and independent learning. In the first two years you will spend approximately 20% of your time in lectures and tutorials and approximately 5% in supervised laboratory sessions. The rest of the time is dedicated to independent study. The nominal total workload amounts to 60 ECTS per year and at Imperial, each ECTS credit taken equates to an expected total study time of 25 hours, i.e. 1500 hours per year.

Assessment Strategy

Assessment Methods

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

- Programming exercises
- Online programming tests
- Written coursework
- Computer-based coursework
- Written examinations
- Computer-based examinations
- Software demonstrations
- Written reports
- Research summaries

- Oral presentations

Each examinable module comprises coursework that is designed to help you master key elements of the subject and, in part, to help prepare you for the final assessment, which is typically a written or computer-based examination.

In each of the first two years there is a substantial programme of continuous assessment, which is mostly centred around practical laboratory exercises of growing size and complexity. In the first year there are also online programming tests for each of the major programming languages you will study.

You will receive written feedback on all coursework and laboratory exercises, including online programming tests. You will also receive verbal feedback on many other aspects of your study, such as presentation and problem solving skills and your progress in group and individual projects.

Written examinations are held at the beginning of the summer term for first and second year modules and at the end of the Autumn and Spring terms for third and fourth year modules.

The weighting of coursework varies among modules, with the normal weighting being 15%. The various assessments allow you to demonstrate that you have met the intended learning outcomes for each module and these collectively contribute towards your achievement of the programme learning outcomes, detailed above.

Balance of assessment
The approximate percentages below are based on a typical pathway through the course. Note that laboratory work comprises mostly independent study, although supervised laboratory sessions are also timetabled throughout the year.

	Year 1	**Year 2**	**Year 3**	**Year 4**
Coursework	10%	10%	83% (total coursework/ examinations)*	9%
Examinations	57%	57%		50%
Integrated laboratory	33%	33%	0%	0%
Project work	0%	0%	17%	41%

* the specific balance of coursework/examinations will depend on the module choices

Academic Feedback Policy

Feedback may be provided in one of a number of formats, including:

- Written, e.g. in the form of specimen solutions, written and/or verbal comments on individual assignments, class-wide feedback.
- Verbal, e.g. during or after face-to-face discussions with an assessor or in a classroom feedback session.
- Peer-to-peer, e.g. from a senior undergraduate teaching assistant, or peer student
- Personal, e.g. from your personal tutor regarding your overall progress.

You will receive feedback on formative, developmental assessments and on summative coursework assessments. All feedback will be provided in a timely manner that reflects the size and complexity of the assignment and the class size; most feedback will be returned within two weeks of the work being submitted.

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.		
Description	Mandatory/Optional	Approximate cost
N/A	N/A	N/A

Programme Structure

Year 1 – FHEQ Level 4
Students study all core modules.

Code	Module Title	Core/ Elective	Group*	Term	Credits
	Logic and Reasoning	Core		1,2	5
COMP40008	Graphs and Algorithms	Core		2	5
COMP40009	Computing Practical 1 (for JMC)	Core		1, 2, 3	20
MATH40009	Introduction to University Mathematics	Core		1	5
	Analysis 1	Core		1	10
	Calculus and Applications	Core		1	10
	Linear Algebra and Groups for JMC	Core		1,2	5
				Credit Total	**60**

Year 2 - FHEQ Level 5
Students study all core modules (30 ECTS).
Conditions to be satisfied for electives:

- **Choose 10 ECTS points from Group A (= CO modules)**
- **Choose 10 ECTS points from Group B (= MA modules)**
- **Choose 10 ECTS points from Group C (= MA modules)**
- ***Note: some modules in Groups A and C will also be made available in Year 3 (in Groups D/E)***

Students must choose exactly one of the two group project options, CO271 or M2R

Code	Module Title	Core/ Elective	Group	Term	Credits
	Operating Systems	Core		1	5
	Software Engineering Design	Core		1	5
	Computing Practical 2 (for JMC)	Core		1, 2	10
	Numerical Analysis for JMC	Core		2	5
	Probability and Statistics for JMC	Core		1	5
	Algorithm Design and Analysis	Elective	A, D	1	5
	Compilers	Elective	A, D	2	5
	Symbolic Reasoning	Elective	A, D	2	5
	Models of Computation	Elective	A, D	1	5
	Year 2 Computing Group Project	Elective	A	3	5
	Multivariable Calculus and Differential Equations	Elective	B	1, 2	10
	Analysis 2	Elective	B	1, 2	10
	Group Research Project in Mathematics for JMC	Elective	C	3	5

	Groups and Rings	Elective	C, E	1	5
	Lebesgue Measure and Integration	Elective	C, E	2	5
	Network Science	Elective	C, E	1	5
	Partial Differential Equations in Action	Elective	C, E	2	5
	Statistical Modelling 1	Elective	C, E	2	5
				Credit Total	**60**

Year 3 - FHEQ Level 6
Students take three core/compulsory modules (22.5 ECTS).
ALL conditions to be satisfied for elective groups D, E, F, G:

- **Choose a maximum of 10 ECTS points from Groups D and E (= year 2 modules)**
- **Choose a minimum of 10 ECTS points from Groups D and F (= CO modules)**
- **Choose a minimum of 15 ECTS points from Groups E and G (= MA modules)**
- **Overall choose from DEFG a minimum of 37.5 and a maximum of 40 ECTS points**

Code	Module Title	Core/ Elective	Group	Term	Credits
	Software Engineering Group Project	Core		1, 2	10
	Industrial Placement for JMC (First Part)	Core		3	7.5
	I-Explore	Compulsory		1 and/or 2	5 or 7.5
	Algorithm Design and Analysis	Elective	A, D	1	5
	Compilers	Elective	A, D	2	5
	Symbolic Reasoning	Elective	A, D	2	5
	Models of Computation	Elective	A, D	1	5
	Systems Verification	Elective	F	2	5
	Logic-Based Learning	Elective	F	2	5
	Concurrency	Elective	F	1	5
	Computer Vision	Elective	F	1	5
	Computer Graphics	Elective	F	2	5
	Custom Computing	Elective	F	2	5
	Communicating Computer Science in Schools	Elective	F	2	5
	Network and Web Security	Elective	F	2	5
	Advanced Computer Architecture	Elective	F	2	5
	Robotics	Elective	F	1	5
	Simulation and Modelling	Elective	F	1	5

	Pervasive Computing	Elective	F	2	5
	Performance Engineering	Elective	F	2	5
	Operations Research	Elective	F	1	5
	Distributed Algorithms	Elective	F	2	5
	Information and Coding Theory	Elective	F	1	5
	Computer Architecture	Elective	F	1	5
	Type Systems for Programming Languages	Elective	F	1	5
	Introduction to Machine Learning	Elective	F	2	5
	Databases	Elective	F	1	5
	Computer Networks and Distributed Systems	Elective	F	2	5
	Advanced Databases	Elective	F	1	5
	Groups and Rings	Elective	C, E	1	5
	Lebesgue Measure and Integration	Elective	C, E	2	5
	Network Science	Elective	C, E	1	5
	Partial Differential Equations in Action	Elective	C, E	2	5
	Statistical Modelling 1	Elective	C, E	2	5
	Fluid Dynamics 2	Elective	G	2	7.5
	Fluid Dynamics 1	Elective	G	1	7.5
	Mathematical Physics 1: Quantum Mechanics	Elective	G	1	7.5
	Finite Elements: Numerical Analysis and Implementation	Elective	G	2	7.5
	Methods for Data Science	Elective	G	1	7.5
	Special Relativity and Electromagnetism	Elective	G	1	7.5
	Tensor Calculus and General Relativity	Elective	G	2	7.5
	Mathematical Finance: An Introduction to Option Pricing	Elective	G	1	7.5
	An Introduction to Partial Differential Equations	Elective	G	1	7.5
	Asymptotic Analysis	Elective	G	1	7.5
	Computational Partial Differential Equations 1	Elective	G	2	7.5
	Numerical Solution of Ordinary Differential Equations	Elective	G	1	7.5
	Computational Linear Algebra	Elective	G	1	7.5

	Group Theory	Elective	G	1	7.5
	Galois Theory	Elective	G	2	7.5
	Group Representation Theory	Elective	G	2	7.5
	Number Theory	Elective	G	1	7.5
	Algebraic Number Theory	Elective	G	2	7.5
	Algebraic Combinatorics	Elective	G	1	7.5
	Fourier Analysis and Theory of Distributions	Elective	G	1	7.5
	Measure and Integration	Elective	G	1	7.5
	Geometry 1: Algebraic Curves	Elective	G	1	7.5
	Geometry 2: Algebraic Topology	Elective	G	1	7.5
	Geometry of Curves and Surfaces	Elective	G	1	7.5
	Probability Theory	Elective	G	2	7.5
	Mathematical Logic	Elective	G	1	7.5
	Functional Analysis	Elective	G	1	7.5
	Markov Processes	Elective	G	1	7.5
	Algebra 3	Elective	G	1	7.5
	Dynamical Systems	Elective	G	1	7.5
	Bifurcation Theory	Elective	G	2	7.5
	Statistical Theory 1	Elective	G	2	7.5
	Survival Models and Actuarial Applications	Elective	G	2	7.5
	Quantitative Methods in Retail Finance	Elective	G	2	7.5
	Statistical Modelling 2	Elective	G	2	7.5
	Applied Probability	Elective	G	1	7.5
	Time Series	Elective	G	1	7.5
	Stochastic Simulation 1	Elective	G	1	7.5
				Credit Total	Min 60 Max 62.5

Year 4 - FHEQ Level 7
Students must select one individual project from Group H (20 ECTS).
ALL conditions to be satisfied for elective groups I and J:

- **Choose a minimum of 10 ECTS points from Group I (= CO modules)**
- **Choose a minimum of 15 ECTS points from Group J (= MA modules)**
- **Overall choose from I and J a minimum of 40 and a maximum of 42.5 ECTS points**

Code	Module Title	Core/ Elective	Group	Term	Credits
	Industrial Placement for JMC (Second Part)	Core		Summer	30
	Separation Logic: Local Reasoning about Programs	Elective	I	1	5
	Concurrent Processes	Elective	I	1	5
	Privacy Engineering	Elective	I	1	5
	Cryptography Engineering	Elective	I	2	5
	Scalable Systems for the Cloud	Elective	I	1	5
	Machine Learning for Imaging	Elective	I	2	5
	Advanced Computer Graphics	Elective	I	2	5
	Computational Finance	Elective	I	2	5
	Reinforcement Learning	Elective	I	1	5
	Advanced Robotics	Elective	I	2	5
	Complexity	Elective	I	1	5
	Software Reliability	Elective	I	2	5
	Advanced Security in Smartphone and IoT Systems	Elective	I	2	5
	Deep Learning	Elective	I	2	5
	Principles of Distributed Ledgers	Elective	I	2	5
	Probabilistic Programming	Elective	I	2	5
	Program Analysis	Elective	I	1	5
	Advanced Issues in Object Oriented Programming	Elective	I	1	5
	Machine Arguing	Elective	I	1	5
	Software Engineering for Industry	Elective	I	2	5
	Computational Optimisation	Elective	I	1	5
	Quantum Computing	Elective	I	1	5
	Natural Language Processing	Elective	I	2	5
	Probabilistic Inference	Elective	I	2	5
	Mathematics for Machine Learning	Elective	I	1	5
	Modal Logic	Elective	I	1	5

	Computing Individual Project (JMC MEng)	Elective	H	1, 2, 3	20
	Maths Individual Project (JMC MEng)	Elective	H	1, 2, 3	20
	Fluid Dynamics 1	Elective	J	1	7.5
	Fluid Dynamics 2	Elective	J	2	7.5
	Introduction to Geophysical Fluid Dynamics	Elective	J	2	7.5
	Hydrodynamic Stability	Elective	J	2	7.5
	Vortex Dynamics	Elective	J	2	7.5
	Asymptotic Analysis	Elective	J	1	7.5
	Dynamics of Games	Elective	J	1	7.5
	Dynamical Systems	Elective	J	1	7.5
	Bifurcation Theory	Elective	J	2	7.5
	Advanced Dynamical Systems	Elective	J	2	7.5
	Random Dynamical Systems and Ergodic Theory: Seminar Course	Elective	J	2	7.5
	Geometric Mechanics	Elective	J	1	7.5
	Dynamics, Symmetry and Integrability	Elective	J	2	7.5
	Mathematical Finance: An Introduction to Option Pricing	Elective	J	1	7.5
	Mathematical Biology	Elective	J	1	7.5
	Methods for Data Science	Elective	J	1	7.5
	Mathematical Physics 1: Quantum Mechanics	Elective	J	1	7.5
	Special Relativity and Electromagnetism	Elective	J	1	7.5
	Tensor Calculus and General Relativity	Elective	J	2	7.5
	Theory of Complex Systems	Elective	J	2	7.5
	Quantum Mechanics 2	Elective	J	2	7.5
	Methods of Mathematical Physics	Elective	J	1	7.5
	Stochastic Differential Equations	Elective	J	1	7.5
	Introduction to Partial Differential Equations	Elective	J	1	7.5
	Function Spaces and Applications	Elective	J	1	7.5
	Advanced Topics in Partial Differential Equations	Elective	J	2	7.5
	Finite Elements: Numerical Analysis and Implementation	Elective	J	2	7.5

	Numerical Solution of Ordinary Differential Equations	Elective	J	1	7.5
	Computational Linear Algebra	Elective	J	1	7.5
	Computational Partial Differential Equations	Elective	J	2	7.5
	Scientific Computation	Elective	J	2	7.5
	Probability	Elective	J	2	7.5
	Functional Analysis	Elective	J	2	7.5
	Fourier Analysis and Theory of Distributions	Elective	J	2	7.5
	Measure and Integration	Elective	J	1	7.5
	Geometric Complex Analysis	Elective	J	2	7.5
	Analytic Methods in Partial Differential Equations	Elective	J	2	7.5
	Stochastic Calculus with Applications to Non-Linear Filtering	Elective	J	1	7.5
	Markov Processes	Elective	J	1	7.5
	Geometry of Curves and Surfaces	Elective	J	1	7.5
	Geometry 1: Algebraic Curves	Elective	J	1	7.5
	Geometry 2: Algebraic Topology	Elective	J	1	7.5
	Algebraic Geometry	Elective	J	2	7.5
	Riemannian Geometry	Elective	J	2	7.5
	Manifolds	Elective	J	1	7.5
	Differential Topology	Elective	J	1	7.5
	Complex Manifolds	Elective	J	2	7.5
	Algebra 3	Elective	J	1	7.5
	Group Theory	Elective	J	1	7.5
	Galois Theory	Elective	J	2	7.5
	Group Representation Theory	Elective	J	2	7.5
	Algebraic Combinatorics	Elective	J	1	7.5
	Lie Algebras	Elective	J	2	7.5
	Commutative Algebra	Elective	J	1	7.5
	Infinite Groups	Elective	J	1	7.5
	Algebra 4	Elective	J	2	7.5
	Mathematical Logic	Elective	J	1	7.5

	Modular Representation Theory	Elective	J	2	7.5
	Number Theory	Elective	J	1	7.5
	Algebraic Number Theory	Elective	J	2	7.5
	Number Theory: Elliptic Curves	Elective	J	1	7.5
	Modular Forms	Elective	J	1	7.5
	Statistical Theory	Elective	J	2	7.5
	Statistical Modelling 2	Elective	J	2	7.5
	Applied Probability	Elective	J	1	7.5
	Time Series	Elective	J	1	7.5
	Stochastic Simulation	Elective	J	1	7.5
	Survival Models and Actuarial Applications	Elective	J	2	7.5
	Quantitative Methods in Retail Finance	Elective	J	2	7.5
	Multivariate Analysis	Elective	J	2	5
	Machine Learning	Elective	J	2	5
	Graphical Models	Elective	J	2	5
	Bayesian Methods	Elective	J	2	5
				Credit Total	Min 60 Max 62.5

The above list of elective modules is indicative. In the event that an elective module is suspended or discontinued, we will communicate the changes to you. Further information can be found at: https://www.imperial.ac.uk/study/ug/apply/our-degrees/potential-course-changes/

Progression and Classification

Progression

In order to progress to the next level of study, you must have passed all modules (60 ECTS in the first two years and **45 ECTS** in the third year) in the current level of study at first attempt, at resit or by a compensated pass.

In addition you must have achieved:

i) At least 50.00% in Computing Practical 1 in order to progress to the second year.

ii) An overall weighted average of at least 60.00% in the second year in order to progress to the third year. Students who fail to achieve this will normally be required to transfer to the third year of the BEng programme.

The overall weighted average for each year must be 40.00%, including where a module(s) has been compensated, in order for you to progress to the next year of the programme.

Classification

The marks from modules in each year contribute towards the final degree classification. The industrial placement is PASS/FAIL and does not contribute to the final degree assessment.

In order to be considered for an award, you 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.

Your 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% and Years Three and Four at 36.25%.

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

First	70.00% or above for the average weighted module results
Upper Second	60.00% or above for the average weighted module results
Lower Second	50.00% or above for the average weighted module results
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.

Supporting Information
The Programme Handbook is available at: Computing handbook and Maths handbook
The Module Handbook is available at: Computing modules and Maths modules (MathsCentral)
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