Imperial College London

Programme Information		
Programme Title	Programme Code	HECoS Code
Geophysics	F660/F662	For Registry Use Only

Award	Length of Study	Mode of Study	Entry Point(s)	Total Credits	
				ECTS	CATS
MSci	4 years	Full time	Annually in October	240	480
BSc (Hons)	3 years	Full time	Annually in October	180	360
BSc (Ordinary)	3 years	Full time	None*	150	300
Diploma of Higher Education	2 years	Full time	None*	120	240
Certificate of Higher Education	1 year	Full time	None*	60	120

* The Certificate, Diploma and BSc (Ordinary) are not accredited. They are only available as exit awards, and are not available for entry.
All students must apply to and join a BSc or MSci programme initially.

Ownership			
Awarding Institution	Imperial College London	Faculty	Faculty of Engineering
Teaching Institution	Imperial College London	Department	Earth Science and Engineering
Associateship	Royal School of Mines	Main Location of Study	South Kensington Campus
External Reference			
Relevant QAA Benchmark Statement(s) and/or other external reference points	QAA Subject Benchmark Statement for Earth Science, Environmental Sciences and Environmental Studies		
FHEQ Level	MSci: Level 7 BSc: Level 6 Diploma: Level 5 Certificate: Level 4		
EHEA Level	MSci: 2nd Cycle BSc: 1st Cycle		
External Accreditor(s) (if applicable)			
External Accreditor:	Geological Society of London		
Accreditation received:	2017	Accreditation renewal:	2023

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 Mark Sutton, Director of Undergraduate Studies
Student cohorts covered by specification	2022-23 entry
Date of introduction of programme	October 2019
Date of programme specification/revision	September 2022

Programme Overview

As a geophysicist, you will study the Earth, learning about the physical and chemical processes that drive the evolution and structure of its interior, the oceans and atmosphere that sculpt and alter its surface, the rocks, minerals and fluids of which it is composed, and the other planets, moons and asteroids to which it is closely related. Geophysicists seek to understand the Earth and other planets through observation and experiment, and to build their understanding upon fundamental scientific principles using interdisciplinary skills in physics, chemistry, mathematics, computing and engineering.

Geophysics deals with profound processes, some of which happen over many millions of years and over thousands of kilometres, and others of which can happen in a small area over a short time but that can nonetheless transform an entire region or even the entire planet, with permanent consequences. As a geophysicist, you will come to understand earthquakes and volcanoes, how and why the solid interior of the Earth flows as if it were a fluid, how the Earth was formed and when it will be destroyed, why the continents move around and how great mountain chains are formed, modified and destroyed, where to find fossil fuels and useful minerals, what is likely to happen to the climate and the biosphere if we are careless in their exploitation, and how and why Earth, Venus and Mars are at once so similar and so different.

An essential part of geophysics is the study of rocks and structures deep in the Earth, using observations and experiments made at the surface, from satellites, or down boreholes. Here, the geophysicist's aim is to unravel the three-dimensional evolution of a portion of the Earth through time using geophysical observations and sound physics. This always requires skill, experience, insight and a good theoretical model; it often also requires large computers and sophisticated computer algorithms. If you want to become a skilled geophysicist, you will be proficient in maths and physics, and be interested in understanding how the Earth works and in unravelling the physical processes that drive it. You will also find that the generic transferable skills that geophysical data analysis requires – for example learning to make appropriate inferences from incomplete and inconsistent data – are in high demand across a wide range of careers, including those that require accurate decision-making using inadequate real-world information.

The first two years of the programme will prepare you for a major independent project in which you will work up several geophysical datasets to reach your own independent conclusions. Among other resources, this project will use data that you and your fellow students have acquired on a geophysical field trip at the end of year two; this is currently run in the mountains of Cyprus but has previously run in the Moroccan desert and may move to a new location in future years. In preparation for this project, you will learn the skills required in formal lectures, in detailed supervised practical classes, and in the field. You will also learn the necessary supporting mathematics, physics, chemistry and geochemistry, geology, computer programming and computer applications, and larger-scale Earth and planetary science.

In the third year, you will complete your independent project, and select more advanced and diverse topics from among a wide range of elective modules. These electives vary from year to year, but always include a mixture of geophysical, geochemical, geological, geo-environmental and planetary modules. In the fourth year, MSci students undertake a major research project, dedicating an entire term to this intensive assignment. Projects are undertaken in close collaboration with world-leading research groups in geoscience, and tackle significant questions, datasets and problems in core geophysics, but that can also be in planetary or environmental geoscience, in geology or geochemistry, or in engineering, industrial and applied applications of geophysics. The fourth year of the MSci programme will take you to the edges of human knowledge in some areas of geoscience, and will involve you directly in trying to push back those boundaries.

The Department of Earth Science and Engineering runs a relatively small undergraduate programme with an intake of around 80 students per year. This small size, together with the travel, adventure and challenge of fieldwork, and the close supervision and interaction that is typically encountered during collaborative practical work in the classroom, means that Geophysics students forge a strong sense of community and professional identity at Imperial, and you are likely to build life-long bonds with your class mates and your teachers. We are a hybrid department, populated by both engineers and scientists; while our degrees are primarily science-based, we engage our engineers actively within the undergraduate programme to engender within our science graduates an understanding of engineering principle, ethos and practice. On graduation, you will join a well-connected and extended family of former graduates from the Royal School of Mines that extends into all corners of the world, and that is represented within almost every major international company and organisation that operates within earth science and engineering.

BSc vs MSci

We offer both three year and four year programmes in Geophysics. Three year programmes lead to the BSc Honours degree and four year programmes lead to the MSci (Master in Science) degree. You will gain independent project and fieldwork experience in both the BSc and MSci programmes; the MSci programme, however, provides greater depth and breadth in both, and additionally provides you with the opportunity to take more elective modules and hence increase your breadth of subject-knowledge.

Transferring between programmes

The wider Geoscience programme is constructed such that MSci and BSc Geophysicists who are appropriately qualified, can readily transfer to other geoscience BSc or MSci degree programmes including Earth and Planetary Science, Geology, and Earth Science. This last programme is designed specifically for students who are unable, or do not wish, to undertake the full fieldwork programme that is required for accreditation within the Geophysics degree. You must normally transfer to a Geology degree no later than January of your first year. You must normally transfer to an Earth and Planetary Science or Earth Science degree no later than January of your second year.

Learning Outcomes

Upon successful completion of four years of study (leading to the award of an MSci for students graduating after four years), a typical Geophysics graduate will be able to:

- Demonstrate mastery of the terminology of geophysics, geochemistry and geology.
- Demonstrate a comprehensive knowledge of the principal characteristics and histories of the interior, surface and climate of the Earth, the methods used to ascertain these characteristics, and the physical, chemical and geological processes that explain them.
- Use effectively the principal techniques and theories of mathematics, physics, chemistry, engineering and computer programming to problems and processes in earth and planetary science.
- Provide quantitative, mathematically based, explanations and descriptions of the major dynamical processes that drive plate tectonics and associated phenomena.
- Synthesise observations, evidence and theory across different areas of earth and planetary science, recognising and explaining similarities and differences between different regions, times, planets and processes.
- Demonstrate a high-level of professional skill in written, verbal and online technical communication, engaging and persuasive presentation, problem solving and project management.
- Demonstrate confidence and accuracy in acquiring, evaluating, processing, interpreting, modelling and inverting geophysical and remote-sensing datasets, including the analysis of their accuracy and uncertainties.
- Work independently, evaluate progress, and report technical observations, methods and conclusions effectively.
- Evaluate geological, geophysical, geochemical and remote sensing data.
- Demonstrate awareness of societal and industrial needs, practical engineering solutions to real-world problems, and environmental and human impact in relation to geoscience.
- Discuss with confidence the theories, principles, and outstanding controversies for major processes, phenomena and observations within earth science.

- Describe the principal characteristics of the terrestrial planets, major moons and minor bodies in the Solar System, their interiors and motion, and the physical processes that govern these characteristics.
- Describe and explain how major earth resources are generated, their global distribution and characteristics, and the methods that can be used for their discovery and exploitation.
- Demonstrate mastery of at least one advanced geophysical technique for acquiring, generating, analysing, evaluating or challenging observations or theory within earth and planetary science.
- Conceive, design, execute, critique, revise, document and present an original research project.
- Synthesise original scientific literature extending into active research areas at the boundaries of the subject.
- Analyse major unsolved questions within earth science, understanding their history, context and importance, and display confidence in formulating, evaluating and advancing well-argued opinions on how these questions might be resolved.

Upon successful completion of three years of study (leading to the award of a BSc for students graduating after three years), a typical Geophysics graduate will be able to:

1. Demonstrate mastery of the terminology of geophysics, geochemistry and geology.
2. Demonstrate a comprehensive knowledge of the principal characteristics and histories of the interior, surface and climate of the Earth, the methods used to ascertain these characteristics, and the physical, chemical and geological processes that explain them.
3. Use effectively the principal techniques and theories of mathematics, physics, chemistry, engineering and computer programming to problems and processes in earth and planetary science.
4. Provide quantitative, mathematically based, explanations and descriptions of the major dynamical processes that drive plate tectonics and associated phenomena.
5. Synthesise observations, evidence and theory across different areas of earth and planetary science, recognising and explaining similarities and differences between different regions, times, planets and processes.
6. Demonstrate a high-level of professional skill in written, verbal and online technical communication, engaging and persuasive presentation, problem solving and project management.
7. Demonstrate confidence and accuracy in acquiring, evaluating, interpreting and modelling geophysical and remote-sensing datasets
8. Work independently, evaluate progress, and report technical observations, methods and conclusions effectively.
9. Evaluate geological, geophysical, geochemical and remote sensing data.
10. Demonstrate awareness of societal and industrial needs, practical engineering solutions to real-world problems, and environmental and human impact in relation to geoscience.
11. Discuss with confidence the theories, principles, and outstanding controversies for major processes, phenomena and observations within earth science.
12. Describe the principal characteristics of the terrestrial planets, major moons and minor bodies in the Solar System, their interiors and motion, and the physical processes that govern these characteristics.
13. Describe and explain how major earth resources are generated, their global distribution and characteristics, and the methods that can be used for their discovery and exploitation.

Upon successful completion of two years of study (leading to the award of a Diploma for students exiting after two years), a typical student will be able to:

1. Demonstrate accuracy in their use of the terminology of geoscience.
2. Demonstrate a good knowledge of the principal characteristics of the interior, surface and biosphere of the Earth, their histories, and the physical and geological processes that explain these characteristics.

3. Apply the principal techniques and theories of mathematics, physics, chemistry, engineering and computer programming to geoscience.
4. Provide quantitative explanations and descriptions of the major dynamical processes that drive plate tectonics and associated phenomena.
5. Explain accurately the methods used to make observations about the surface and interior of the Earth, and be able to report the principal results produced by these methods.
6. Write accurately about technical subjects and about geoscience. Demonstrate accuracy in evaluating and interpreting geophysical and remote-sensing datasets.
7. Demonstrate accuracy in evaluating and interpreting geophysical and remote-sensing datasets.
8. Work independently, evaluate progress, and report technical observations, methods and conclusions effectively.
9. Evaluate geological, geophysical, geochemical and remote sensing data.
10. Demonstrate awareness of societal and industrial needs, practical engineering solutions to real-world problems, and environmental and human impact in relation to geoscience.

Upon successful completion of one year of study (leading to the award of a Certificate for students exiting after one year), a typical student will be able to:

1. Demonstrate familiarity with the terminology of geoscience.
2. Describe the principal characteristics of the interior and surface of the Earth, and the physical and geological processes that explain these characteristics.
3. Apply mathematics, physics, chemistry and computer programming to problems in geoscience.
4. Explain the concepts of plate tectonics, isostasy and heat transport in the Earth.
5. Outline some of the methods used to make observations about the surface and interior of the Earth, and be able to report the main results produced by these methods.
6. Write accurately about technical subjects and about geoscience.

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	**A-level** A minimum of AAA overall or equivalent. Normally to include a minimum of A in Mathematics and A in Physics. General Studies and Critical Thinking are **not** accepted. **International Baccalaureate** A minimum of 38 points overall. To include a minimum of 6 in Mathematics and Physics at higher level. For further information on entry requirements, please go to https://www.imperial.ac.uk/study/ug/apply/requirements/ugacademic/
Non-academic Requirements	None
English Language Requirement	Standard requirement Please check for other Accepted English Qualifications
Admissions Test/Interview	All short-listed candidates are invited for interview. Interviews normally take place within the Department at Imperial College on Wednesdays

	between October and March. During the interview visit, students meet key members of staff, and have a 30-minute one-to-one interview; existing undergraduates on the programme show prospective students around the department. Both staff and students are on hand during the day to answer questions about the programme, the Department, the College, and life as a student in London. For those, typically overseas students, who are unable to attend an interview in person, interviews and Q&A sessions are also be held remotely via video conference or Skype. There are no admissions tests.

The programme's competency standards documents can be found at:
http://www.imperial.ac.uk/engineering/departments/earth-science/current-student-staff-info/ug/

Learning & Teaching Approach

Geophysics is an inherently interdisciplinary and practical science, which lends itself to a diverse range of classroom, laboratory and field-based teaching methods. As a geophysicist at Imperial, you will learn about both the latest data acquired for example by a rover on Mars, or by the most recent high-tech mass spectrometer uncovering the isotopic chemistry of life in an ancient ocean, first-hand from the scientists who are making these discoveries, and about established theories and observations that provide the foundations for our modern understanding. Reflecting this, our teaching approach is dynamic and flexible, matching the breadth, diversity and rapid evolution of our subject matter.

In the first two years, the major taught elements of the programme are provided by:

- formal lectures to develop necessary theory and background, and expand your intellectual understanding,
- supervised problem and laboratory classes to advance your practical skills and hands-on experience,
- and field modules, run typically in the mountain belts and islands of southern Europe, that integrate this theory and practice, building upon your direct observations in the field to advance your confidence and reinforce the knowledge gained during earlier classroom-based learning.

Most modules involve both theory and practical elements in which the two teaching styles are blended together, so that both forms of learning typically occur within a single class-room session involving student participation integrated into formal lectures. The advantage of this approach is that learning is carefully scaffolded for the student, for example delivering new terminology, concepts and ideas at the beginning of a session, and then immediately reinforcing and integrating this information in a teacher-facilitated, student-focused practical lab class, where knowledge is applied to real-world problems. During most practical classes, graduate teaching assistants are on-hand to support the lecturer and to provide you with continuous opportunities to check and extend your understanding, ask questions, and engage in an informed and productive dialogue.

You will often be encouraged to work in small groups during practical classes and to engage in discussion with your peers and teachers about the material covered. During taught fieldwork, novice geoscientists are immediately introduced to the professional standards and competencies expected by employers, and you will be working with established industry equipment, procedures and practices. The aim is to foster a sense of community amongst your peers, and to help you to develop your professional identity by working to professional standards from the outset. The learning gained from this combined lecture-practical-fieldwork approach are supported and strengthened by small-group tutorials, group seminars, and computer-programming workshops. Ultimately, this blended approach to learning will help to make you into a professional geophysicist, confident in the necessary mathematics, physics and chemistry, able to write original computer programs, and with skills and knowledge applicable across the breadth of the Earth and planetary sciences.

In years three and four, formal teaching will become more diverse and wide-ranging as you choose from a range of elective modules that typically span pure geophysics, geochemistry, geology, climate, environmental and engineering geology, the petroleum and mining industries, planetary science, and a range of transferable skills including management, business and technical writing. The elective modules introduce both depth and breadth to your studies – taking some subjects to the limits of what is currently known and understood, and introducing new topics in areas that you will not previously have studied in detail. These modules are designed to challenge you, and are taught using a diverse range of techniques – some will be strongly practical, others will be predominantly theoretical, and yet others will be project based.

For MSci students, the fourth and final year involves advanced taught modules and the major MSci research project. The results of many MSci projects are of publishable quality, and some are published in peer-reviewed academic journals. MSci projects vary hugely from student to student, and may involve almost any combination of fieldwork, laboratory experiment, computer simulation, theory and practical work. An MSci project will develop your high-level transferable skills in scientific research, synthesis, analysis, collaboration and project management, help you to master some advanced techniques, technologies and ideas, and expose you to rigours of solving real difficult scientific and technical problems in a finite time. The MSci-year is completed by your choice of either: an advanced geological field trip that seeks to understand the structure, evolution and processes occurring within an actively forming and deforming mountain belt; recently this field trip has been run in the Italian Apennines, or a group seismic processing and inversion project in which small teams compete to learn the most about the sub-surface from a particular suite of seismic data.

Throughout the programme, a number of workshops, tutorials and other activities run that are designed to build a particular focus, and develop particular skills, in each year. These are:

- Year 1 – Science Focus: builds core skills in geoscience, mathematics, physics and chemistry.
- Year 2 – Engineering Focus: builds awareness of society, industry, and practical solutions to problems.
- Year 3 – Professional Focus: develops skills in communication, presentation, teamwork, problem-solving and project management.
- Year 4 – Research Focus: develops skills in project design, advanced research methods, and frontier geoscience, and actively explores the scientific boundaries of human knowledge.

Throughout the programme, extensive use is made of technology to enhance and support you in the classroom, during private study, and on fieldwork. If, for example, you choose to take an elective module that covers processes on another planet, then you may find yourself involved in a virtual field trip to the surface of that planet, or if you study advanced seismic interpretation, then you will be using advanced 3D commercial software to explore the subsurface of the Earth for valuable resources. Lecturers also seek to integrate technology into their day-to-day teaching, using online voting, instructional videos and e-books to support and diversify your learning experience.

Workload

Module size at Imperial is measured in ECTS (European Credit Transfer System) credits. One ECTS represents about 25 hours of student effort for a typical conscientious student, including formal teaching, fieldwork, private study, examination preparation and assessment. A full academic year involves 60 ECTS, or about 1500 hours of study in total.

A typical module taught over one term will be worth 5 ECTS. It will involve about 30 hours of formal teaching in lectures, practicals, tutorials and workshops, about 64 hours of coursework, problem solving, private study and project work, and about 30 hours of revision for a one-hour examination. There is significant variation in this balance between different modules, but all modules of equivalent value involve similar levels of commitment and workload.

Lectures, practicals and other formal activities take place on weekdays only, with Wednesday afternoons normally remaining free. There is no teaching at weekends except for field modules that are run outside London; these typically run for ten to twelve days and so nearly always involve a weekend spent on fieldwork. We do not normally schedule teaching out of term time, though it can sometimes be necessary for field modules to run into vacations because of practical restrictions on accommodation, transport or even the state of the tide at coastal locations. Although it is possible to complete the independent geological project entirely within term time, many students chose to extend this highly rewarding field project into the summer vacation between years two and three.

Assessment Strategy

Assessment Methods

You will have already experienced various forms of academic assessment during your previous education. At Imperial, we use assessment in two ways: *Formative assessment* is used to develop your skills, knowledge and understanding, and to help you judge your own progress; formative assessment does not contribute to your final marks and class of degree awarded. *Summative assessment* involves formal assessment of your work, through examination, coursework and project work; summative assessment does contribute to your final result.

Formative assessment is provided throughout the programme in a variety of forms. Almost all practical classes, problem classes, workshops, and field trips involve formative assessment throughout, supported by direct verbal feedback from lectures and graduate teaching assistants in the classroom, the provision of worked examples and correct solutions for practicals and coursework, and written comments in field and laboratory notebooks. Fieldwork provides ample opportunity for formative feedback, as students and teachers engage in dialogue in the field. Many lectures involve mini tests, and other forms of rapid assessment within the lecture or associated practical class, and tutorial work and small independent projects in the first two years provide more-structured formative assessment.

Summative assessment is provided through formal written examinations, practical examinations, assessed coursework, and independent project, laboratory and fieldwork reports. The independent project may also be assessed by oral examination, and some specialist elective modules may involve assessment of oral presentations, posters and team performance.

The exact balance of summative assessment through the programme depends upon which elective modules are taken, but is likely to be approximately:

	Coursework	Practical	Examination
Year 1	10%	20%	70%
Year 2	10%	30%	60%
Year 3	5%	40%	55%
Year 4	5%	55%	40%

Coursework: unsupervised written assessment such as essays and problem sheets – typically you will conduct coursework independently outside normal timetabled classes.

Practical: assessment of your performance in timetabled practical, laboratory and field classes, and in major projects – typically assessment is through project reports, field and laboratory notebooks, verbal and poster presentations, oral examinations, and group exercises.

Examination: invigilated assessment, including practical examinations and supervised in-class tests as well as conventional written examinations – typically you will answer previously unseen questions in a fixed time period.

In Geophysics, several examinations will have a strong practical element. As the programme progresses, the importance of examination decreases, and more weight is placed upon performance in independent projects.

Academic Feedback Policy

Timely, well-structured, relevant feedback is an integral part of the learning process; it is prioritised by teachers and highly valued by students in Earth Science and Engineering. Feedback is provided frequently and in many different formats throughout the programme. Both written and verbal feedback is provided during practical and problem classes, in workshops, in tutorials, during field work, and in response to assessed and unassessed coursework. Much of this feedback is instant; it occurs as students are engaging with the task, and helps them to check their understanding, and evaluate their own progress, in real time. For example, during fieldwork, verbal feedback is provided constantly throughout the working day, allowing students to change and improve their learning approaches in an iterative fashion. Students are encouraged to reflect and act upon their feedback, particularly with regard to their written projects in years one, two and three, which build in complexity and difficulty. Written feedback on minor coursework is normally be provided within two weeks of submission.

Feedback will normally be individual on assessed summative coursework and project work, and will normally be generic on unassessed formative coursework, provided verbally or in writing, typically during the next teaching session or delivered online. Feedback on major projects will normally be provided within five weeks in term time; this is typically written feedback focussed on how the student could improve the work for the future

Generic feedback is provided on all examinations, once summative marks are released; where appropriate, individuals can request to be given supervised access to their exam scripts. 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
Field clothing	Mandatory	£150 total
Funding is available for students who may require additional support towards mandatory fieldwork costs. You should refer to the departmental webpages for the latest funding schemes and application deadlines: https://www.imperial.ac.uk/earth-science/current-student-staff-info/ug/ (see Funding & Scholarships tab)		

Important notice: The Programme Specifications are the result of a large curriculum and pedagogy reform implemented by the Department and supported by the Learning and Teaching Strategy of Imperial College London. The modules, structure and assessments presented in this Programme Specification are correct at time of publication but might change as a result of student and staff feedback and the introduction of new or innovative approaches to teaching and learning. You will be consulted and notified in a timely manner of any changes to this document.

Programme Structure[1]					
Year 1 – FHEQ Level 4 Students study all core and compulsory modules, and one elective module from group B.					
Code	Module Title	Core/ Compulsory/ Elective	Group	Term	Credits
EART40001	Dynamic Earth and Planets	Core		1 & 2	7.5
EART40002	Stratigraphy and Geomaterials	Core		1	7.5
EART40005	Maths Methods 1	Core		1	5
EART40008	Deforming the Earth	Core		2	5
EART40010	Geology in the Field	Core		3	7.5
EART40011	Physical and Surface Processes	Core		2	7.5
EART40012	Volcanism and Internal Processes	Core		2	5
EART40005	Maths Methods 2	Core		2	5
EART40003	Programming for Geoscientists	Compulsory		1	5
EART40006	Chemistry for Geoscientists	Elective	B	1	5
EART40007	Low Temperature Geochemistry	Elective	B	1	5
				Credit Total	**60**

Year 2 - FHEQ Level 5 Students study all core and compulsory modules.					
Code	Module Title	Core Compulsory	Group	Term	Credits
EART50001	Solar System Science	Core		1	5
EART50002	High-temperature Geochemistry	Core		1	5
EART50004	Pure and Applied Geophysics	Core		1 & 2	7.5
EART50006	Field Geophysics	Core		2 & 3	10
EART50010	Maths for Scientists and Engineers	Core		1 & 2	7.5
EART50011	Mechanics and Waves	Core		1 & 2	7.5

[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 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.

EART50018	Seismology and Numerical Methods	Core		2	7.5
EART50003	Maps and Structures	Compulsory		1	5
EART50009	Remote Sensing Earth and Planets	Compulsory		2	5
				Credit Total	**60**

Year 3 - FHEQ Level 6

Students study all core and compulsory modules, plus two modules from group C, one elective from group H, and four modules from group D. Students may take a maximum of three level-7modules.

Students must have earned 60 ECTS at Level 7 by the end of Year 4.

Code	Module Title	Core Elective Compulsory	Group	Term	Level	Credits
EART60001	Independent Project	Core		1	6	15
	I-Explore	Compulsory		1 &/or 2	6	5
EART60004	Near-surface Seismic Imaging	Elective	C	1	6	5
EART60004	Continental Tectonics	Elective	C	1	6	5
EART60003	Climate	Elective	C	1	6	5
EART60005	Advanced Remote Sensing	Elective	C	1	6	5
EART60023	Practical Seismic Data Processing	Elective	H	3	6	5
EART60006	Integrated Advanced Field Geology	Elective *	H	3	6	5
					Credit Total	**60**

Year 4 - FHEQ Level /7

Students study all core modules, one elective from group J, and five modules from group D – see table below. Students may take a maximum of three level-6 modules which may include I-Explore as an elective for credit.

Students must have earned 60 ECTS at Level 7 by the end of Year 4.

Code	Module Title	Core Elective	Group	Term	Level	Credits
EART70009	MSci Independent Project	Core		1	7	30
EART70157	Geophysics Synthesis Group Project	Elective	J	3	7	5
EART70019	Field Geology of an Active Mountain Belt	Elective *	J	3	7	5
					Credit Total	**60**

Year 3/4 - FHEQ Level 6/7 – Group D electives

Different sub-sets of modules are offered each year, with a minimum of 12 elective modules normally available.

Code	Module Title	Core Elective	Group	Term	Level	Credits
EART60008	Mining Environmental Management	Elective	D	2	6	5

EART60009	Ore Deposits	Elective *	D	2	6	5
EART60011	Environmental Seminars	Elective	D	2	6	5
EART60010	Hydrogeology and Fluid Flow	Elective	D	2	6	5
EART60028	Tectonics of the Oceans	Elective	D	2	6	5
EART60024	Planetary Surfaces	Elective	D	2	6	5
EART60014	Advanced Programming	Elective	D	2	6	5
EART60021	Gravity, Magnetism and Orbital Dynamics	Elective	D	2	6	5
EART60016	Geological and Coastal Engineering	Elective	D	2	6	5
EART60017	Astrobiology	Elective	D	2	6	5
EART60018	Earth Systems	Elective	D	2	6	5
EART60034	Advanced Applied Geophysics	Elective	D	2	6	5
EART60041	Data Science and Machine Learning for Geoscientists	Elective	D	2	6	5
	I-Explore	Elective	D	1 &/or 2	6	5
EART70004	Planetary Chemistry	Elective	D	2	7	5
EART70155	Planetary Physics	Elective	D	2	7	5
EART70152	Palaeobiology	Elective *	D	2	7	5
EART70153	Palaeoceanography	Elective	D	2	7	5
EART70008	Geohazards	Elective	D	2	7	5
EART70048	Geodynamics	Elective	D	2	7	5
EART70010	Applied Geomorphology	Elective *	D	2	7	5
EART70049	Collisions and Craters	Elective	D	2	7	5
EART70012	Meteorites	Elective	D	2	7	5
EART70013	Geophysical Inversion	Elective	D	2	7	5
EART70014	Advanced Exploration Geophysics	Elective	D	2	7	5
EART70151	Geological Reactive Transport	Elective	D	2	7	5
EART70016	Minerals Processing	Elective	D	2	7	5
EART70050	Magmatic Processes and Products	Elective *	D	2	7	5
EART70015	Advanced Exploration Seismology	Elective	D	2	7	5

* These electives may not be suitable for some Geophysics students and may require additional preparation.

Progression and Classification

Progression

Year One: Candidates must achieve an aggregate mark of at least 40.00% for the year, must pass all core modules, and must have earned at least 60 ECTS credits for the year. No more than 15 ECTS may be earned as compensated passes per credit level during the programme.

Year Two: Candidates must achieve an aggregate mark of at least 40.00% for the year, must pass all core modules, and must have earned at least 60 ECTS credits for the year. No more than 15 ECTS may be earned as compensated passes per mdule credit level during the programme.

Additionally, for progression on the MSci, candidates must normally achieve an aggregate mark of at least 60.00%, weighted across years 1 and 2.

Year Three: Candidates must achieve an aggregate mark of at least 40.00% for the year, must pass all core modules, must have earned at least 60 ECTS credits for the year, and must have earned at least 45 credits at level 6 or higher. No more than 15 ECTS may be earned as compensated passes per credit level during the programme.

Year Four: Candidates must achieve an aggregate mark of at least 50.00% for the year, must pass all core modules, must have earned at least 60 ECTS credits for the year, and must have earned at least 60 credits at level 7. No more than 15 ECTS may be earned as compensated passes per moule credit level during the programme.

- The pass mark for modules at levels 4, 5 and 6 is 40.00%, and at level 7 is 50.00%.
- At the discretion of the Board of Examiners, compensated passes may be awarded in non-core modules at levels 4, 5 and 6 that have been awarded 30.00% or higher, and in non-core modules at level 7 that have been awarded 40.00% or higher. Compensated passes are not allowed in core modules. Marks for modules awarded a compensated pass are included in year aggregate marks.
- A single compulsory I-Explore co-curricular module must be taken, and subsequently passed or awarded a compensated fail, but will not be included in calculating the aggregate mark for the year. If optional additional co-curricular modules are taken for credit, then their marks will be included in calculating the aggregate mark for the year.
- The marks for both level-6 and level-7 modules are included in calculating aggregate marks in both years 3 and 4.

Classification

The marks from modules in each year contribute towards the final degree classification using the weighting:

	BSc	MSci
Year 1:	7.50%	7.50%
Year 2:	35.00%	20.00%
Year 3:	57.50%	36.25%
Year 4:	-	36.25%

Final degrees are classified as:

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

None

Supporting Information
The Programme Handbook is available at: http://www.imperial.ac.uk/engineering/departments/earth-science/current-student-staff-info/ug/
The Module Handbook is available at: http://www.imperial.ac.uk/engineering/departments/earth-science/current-student-staff-info/ug
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