

## Competence Standards: Earth Science and Engineering (All Undergraduate Programmes)

These competence standards highlight the core skills students should be able to demonstrate by the end of their programme of study in the Earth Science & Engineering Department. In addition to these competence standards all students will be expected to meet the basic academic competence standards contained within the admissions policy for their programme of study. These competence standards apply to the following degree programmes:

- F600 BSc Geology
- F640 MSci Geology
- F601 MSci Geology with a Year Abroad
- F661 MSci Geology and Geophysics
- F663 MSci Petroleum Geoscience

<http://www.imperial.ac.uk/study/ug/courses/earth-science-department/geology/>

- F662 BSc Geophysics
- F660 MSci Geophysics
- F664 MSci Geophysics with a Year

<http://www.imperial.ac.uk/study/ug/courses/earth-science-department/geophysics/>

Students seeking admission to the Department of Earth Science and Engineering degrees are also advised to consult the Geological Society of London's standard for Chartered Geologist and Chartered Scientist which identifies the key competencies for applicants:

<https://www.geolsoc.org.uk/Membership/Chartership-and-Professional/Applicants/Chartership-Criteria>

This document outlines the expectations for practising professionals, post-graduation.

It should be noted that the Faculty of Engineering believe in providing the widest practicable access to all degree programmes and appreciate that it is not possible to anticipate all circumstances. If it is possible to mitigate the impact of a disability by making a reasonable adjustment to procedures, *e.g.* by the use of an amanuensis or by the application of a specific technology, then every effort will be made to implement this with due consideration to ensuring fairness to all students and ensuring that all health and safety concerns are met. Therefore, the inability to meet one of the below competency standards due to disability does not necessarily preclude entry to a given degree programme but rather constitutes the starting point for a dialogue between the potential applicant, the College's disability officer and the Department.

Area	Competence Standard
<b>Subject specific knowledge and understanding</b>	Ability to perceive, comprehend, synthesise, retain and apply information presented orally and in writing from a range of contexts including large-group, small-group and individual teaching, as well as eLearning, seminars and practical work.
	Ability to undertake guided independent learning.
	Ability to use acquired theoretical and practical knowledge to solve unseen geoscience and engineering problems.
	Ability to follow general laboratory, workshop and/or fieldwork safety guidance and precautions.
	Acceptance of the general principles and practices of geoscience and engineering professional codes of conduct.
	Ability to understand the wider context of the geoscience and engineering discipline, its practical applications, societal impact and limitations.
<b>Intellectual skills</b>	Psychological ability to cope with full-time study in an city environment
	Excellent arithmetic ability
	Ability to prepare, process, and interpret data and/or observations using appropriate techniques.
	Ability to form logical, reasonable conclusions and make sound recommendations based on available data and/or observations.
	Ability to obtain necessary data from scientific and technical documents, reports, and other reference materials
	Ability to undertake work with a high level of initiative and commitment to the task in hand
<b>Practical skills</b>	Physical and manual dexterity to precisely perform precise practical procedures.
	Ability to observe, undertake the measurement of, accurately record and manipulate data and/or observations in a laboratory, workshop and/or fieldwork environment using appropriate equipment (following appropriate training). To use an optical microscope for observations in a laboratory; a compass-clinometer for recording data and to accurately record the data in a hard copy written form in a notebook or on a map or stereonet, graph paper, logging paper or other technical aids..
	Ability to use appropriate equipment competently and safely (following appropriate training). To conduct a range of geophysical surveys (gravity, seismic, topographic and EM/resistivity) safely using appropriate equipment. To log data in field books and electronically, to ensure that they are able to process the raw data to map surface and subsurface properties using appropriate software (excel, geogiga pro suite, GMT, Google Earth) and then present that data in a report (LaTeX or Microsoft suite)
	Ability to use chemicals and other consumables competently and safely (following appropriate training). Basic laboratory techniques, kinetic and isotherm experiments, mineral synthesis, redox reactions, complexation, and a range of analytical methods including mass spectrometry.
	Ability to produce sketches to communicate ideas and concepts.
	Ability to prepare technical drawings by hand (following appropriate training).
	Ability to use computer systems to access learning resources, receive communications regarding the degree programme, undertake assessments and submit assignments.
	Ability to use appropriate geoscience and engineering software packages as an aid to research, analysis, problem solving and presentation. Specific programmes include Adobe Illustrator, Inkscape, ArcGIS, Micromine, and may include Petrel, and other software that has been made available at the time.
	Ability to write code to produce computer programs to aid in solving geoscience and engineering problems (following appropriate training). To include, but not limited to, Python, C, C++ and Matlab.
	Ability to use symbolic and numerical mathematical software as part of practical computation (following appropriate training) To ensure students are able to use specific mathematical software to include, but not limited to LaTeX, Linux.

<b>Fieldwork specific skills</b>	Ability to undertake extensive field trips in the UK or abroad requiring continuous days in an outdoor environment. United Kingdom; France; Spain; Germany; Italy; Cyprus; Sardinia; Crete; Austria and other European countries that may be visited during the course of the degree. For Students on the Year Abroad programme this may additionally include fieldwork in Canada, the US and Australia.
	Ability to safely perform physical activity, whether individually or in a group/team of two students or more, in all types of weather conditions and terrain, which may include underground working where appropriate.
	Ability to make notes, record data and sketch visual representations in hard copy by hand, in potentially adverse weather conditions.
<b>Transferrable skills</b>	Ability to communicate, verbally and in writing, clearly and effectively.
	Ability to present ideas, key facts, problem solutions and results effectively, both orally and in writing, in a variety of settings including group/team work.
	Ability to work as part of a group/team in a range of roles, for the purposes of research, collective problem solving, development of ideas, production of objects and/or communication of results/findings. Ability to recognise and respect the contributions of other team members to promote successful team work.
	Ability to write group/team or individual written technical reports to a professional standard.
	Ability to respond to written material critically, effectively and efficiently.
	Ability to present written technical reports to others and to make oral presentations that are reasoned, logical and time-limited, to a variety of audiences.