This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the course handbook or on-line at http://www.cv.imperial.ac.uk/research/soils/engeo/engeo home page1.html#h. The accuracy of the information contained in this document is reviewed by the University and may be checked by the Quality Assurance Agency.

1. Awarding Institution / Body	University of London
2. Teaching Institution	Imperial College of Science, Technology & Medicine
3. External Accreditation by:	ICE/IStructE/IHIE/Inst of Highways & Transportation
4. Final Award	MSc and DIC
5. Programme Title	Engineering Geology Engineering Geology & Business Management Engineering Geology & Sustainable Development
6. UCAS Code (or other coding system if relevant)	Not applicable
7. Relevant QAA Subject Benchmarking Group(s)	Engineering
8. Date of production/revision	February 2005

9. Educational Aims of the Programme

The programme aims to:

- Produce graduates equipped to pursue careers in Engineering Geology, in industry, governmental and non-governmental organisations;
- Provide the basis for recognising and understanding the major features that govern the behaviour of ground in response to the forces of nature and those generated by man through engineering;
- Understand how this knowledge may be applied in practice in an economical and environmentally friendly way so as to lesson the risk of unwanted outcomes;
- Foster the acquisition and implementation of the design and analytical skills required for the practice of Engineering Geology and it further advance in research;
- Attract highly motivated students, from within the UK, the EU and from overseas;
- Develop new areas of teaching and training, and new means of tuition, to advance scholarship and assist vocational training;

10. Programme Outcomes - *the programme provides opportunities for postgraduate students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes are referenced (**B**) to the Benchmark Statement for Engineering.*

Knowledge and understanding

A. Knowledge and understanding of:	**Teaching/learning methods and strategies**
1. a selection of the major topics in the subject, their recognition and underlying fundamental principles; 2. research techniques which might include information retrieval, experimental design and statistics, modelling and safety; 3. the essential facts, concepts, principles and theories relevant to the student's chosen area of research (**B**); 4. management and communication skills, including problem definition, project design, decision processes, teamwork, written and oral reports, scientific publications (**B**). →	Acquisition of A1 to A4 is obtained by a combination of lectures, seminars, laboratory work, comuter-based work, laboratory coursework and field work. A4 is also supported by courses specifically designed to develop these skills eg by the presentation of coursework to engineering geologists and engineers currently working in companies. Throughout the students are encouraged to undertake independent reading both to supplement and consolidate what is taught and to broaden their knowledge of the subject. Assessment of the student's competence is through a combination of unseen written examinations (A1-4), assessed coursework (A1-4) as well as an individual dissertation designed to develop the student's ability to recognise problems, design a strategy for studying and solving them, and recording that work with logic, clarity and brevity (A1-4)

Skills and other attributes

Learning experience

- Analyse and solve problems using a multidisciplinary approach, applying professional judgements to balance costs, benefits, safety and social and environmental impact;
- Integrate and critically evaluate information;
- Formulate and apply appropriate solutions;

Student Achievement

- Plan and execute safely a series of experiments or computations;
- Use laboratory methods or computer-based tools to generate data;
- Analyse results, determine their strength and validity, and make recommendations;
- Prepare technical reports;
- Give technical presentations;
- Use the scientific literature effectively;
- Communicate effectively through oral presentations, computer processing and presentations, and written reports;
- Apply knowledge and modelling skills;
- Managerial skills; decision processes; objective criteria, problem definition, project design and evaluation needs;
- Integrate and evaluate information from a variety of sources;
- Transfer techniques and solutions from one discipline to another;
- Use Information and Communications Technology;
- Manage resources and time;
- Learn independently with open-mindedness and critical enquiry;
- Learn effectively for the purpose of continuing professional development

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Intellectual skills are developed through the teaching and training methods outlined above in Section 8.

Assessment is through coursework, unseen written examinations, project reports, presentations and a final dissertation.

Practical skills are developed through the formal and approved teaching and learning programme.

Practical experimental and computational skills are developed through project work, laboratory work, and field work, all specifically designed to achieve these aims using both independent and group work, together with project supervisor(s).

Skills in reporting and presenting are taught and developed through course work requiring written reports and presentations to outside staff.

The use of scientific literature is developed throughout the course and specifically in the course requiring student's to present Case Histories.

Practical skills are assessed through project reports and presentation, and by formal examination of individual competences.

The entire course is designed to develop transferable skills; it is a vocational course, in this case focussed to Engineering Geology but applicable to the application of science and engineering in other fields.

Reporting and Communication are taught through workshops and feedback on reports and oral presentations.

Modelling and Simulation are taught through lectures, practical work and during individual research projects.

Management and IT are developed throughout the course by its various project work exercises.

Management of time is developed throughout the course within a framework of staged coursework deadlines; it is the key to success on the course and must be learnt at an early stage.

Independent thinking and critical enquiry are encouraged and developed throughout the course, which is structured and delivered in such a way as to promote them whilst not explicitly teaching them.

These skills are assessed through written examinations, course work and oral presentations, coursework of all kinds, written examinations and a dissertation.

The following reference point was used in creating the Programme Specification:

* Subject benchmarking information for Engineering Geology
* Student Handbook for Course approved by the Senate of Imperial College

Programme structures and features, curriculum units (modules), credit and award requirements

Engineering Geology is concerned with the application of geology in engineering practice; it requires a quantitative knowledge of the behaviour of rock, soil, water and gas, as materials and en masse in both their uncontaminated and contaminated states.

The course is career-orientated and intended to provide appropriate training for professional geologists and engineers. Applicants with degrees in other branches of Earth Science and the natural sciences who possess appropriate experience will also be considered. Applications are also invited from undergraduates completing their first degree who have gained some industrial experience during their degree and who have the motivation for further study, either now or at a future date. Applicants will find industrial experience gained prior to starting these courses of benefit to their studies. The course may be taken either as a full-time, in one year, or part –time over two or three years. All are recognised for the award of the DIC and the MSc degrees.

The course is integrated with the MSc courses in "Soil Mechanics", "Soil Mechanics and Environmental Geotechnics", and "Soil Mechanics and Engineering Seismology"; it includes lecture, laboratory practicals, coursework, field courses and the preparation of a dissertation. Visits to civil engineering works, other sites and appropriate institutions are arranged as appropriate; there is a one-week study tour during the Easter vacation. In addition, independent fieldwork is usually required in connection with the dissertation.

The syllabus of lectures covers the full range of topics within the scope of engineering geology, including the related fields of soil mechanics, rock mechanics, and groundwater hydrology and the application of engineering geology to the solution of problems in environmental geotechnics arising from waste disposal, waste management, urban renewal and sustainable engineering. There is an intensive supporting programme of tutorials, laboratory practicals and coursework, which amounts to about 200 hours. Those following the course with Sustainable Development and Business Management complete 80% of the taught course followed by those studying Engineering Geology. Further details of individual course modules are given on the Departmental website www.cv.ic.ac.uk/courses/main.asp

Term 1	All students attend an introduction to the Department, the administration of their course and Safety and meet their Course Director who acts as their Personal Tutor during the initial phase of the course.. Students may change their options in the first two weeks of term. In addition, Students are required to formally notify the Postgraduate office of their options for examination by December. Those students having difficulties with English language are encouraged, at this stage, to seek remedial support from the English Language Support Unit. The Modules taught this Term are Basic Competences in Engineering Geology, Engineering Geology of Soils and Rocks, Ground Investigation, Engineering Geology Laboratory and Field Work, Engineering Geology Course Work, Basic Soil Mechanics, Lab and Field Techniques, Engineering Rock Mechanics, Hydrogeology and Landfill Engineering. The Term ends with a formal Test. For details of the Business Management option see www.cv.ic.ac.uk/courses/msc/pg busman.asp For details of the Sustainable Development option see www.cv.ic.ac.uk/courses/msc/pg sustdev.asp
Term 2	Students are advised of available dissertation topics and are required to select their dissertation topic by March. They are encouraged to begin to put in place those arrangements that are deemed appropriate for their dissertation from February. The Modules taught this Term are Engineering Geology and Remediation, Engineering Geology Case Histories, Engineering Geology Course Work, Engineering Geology Laboratory Work, Applied Soil Mechanics, Engineering Rock Mechanics, Geotechnics in Practice (a course of lectures from geologists and engineers in industry), Professional Practice in Engineering Geology, Brittle Fracture and Neotectonics, and Air Photo Interpretation. The Term ends with a formal Test. Students are expected to revise for their Exams during the Easter vacation.
Term 3	There are no Modules taught during this Term. Formal tutorials are arranged to assist students with their revision before the Exams. There are 15 hours of formal unseen examinations of which 6 take the form of a continuous paper practical, similar to course work but completed under examination conditions. After the Exams students from all the Geotechnical MSc's complete a combined field course of visits to engineering sites overseas. On return the Engineering Geologists complete a one-week supervised geotechnical mapping field exercise. Students then dedicate themselves full-time to their investigative design or research oriented project ie their dissertation. The projects are conducted at Imperial College, but can involve an industrial collaboration and can be completed overseas by agreement with the Course Director. The assessment is based primarily upon a written dissertation. The dissertation is assessed by the supervisor, in the first instance, and then by a department-nominated moderator. Subsequently, further scrutiny is provided by the External Examiner and the Board of Examiners.

Support for students and their learning:

- One week induction programme for orientation, introduction to library and information technology, and the Department.
- MSc Student Handbook, which includes descriptions of each module.
- Staff:student ratio for teaching of 1:1 at best, 1:5 often, 1:10 frequently
- A large community of postgraduate research students and postdoctoral research workers who work in the general area of geotechnics. The research programmes in the department provide general as well as specific support.
- Dedicated Library and other learning resources and facilities.
- Dedicated computing facilities.
- Many visiting speakers and international visitors
- Access to student counsellors on the South Kensington site.
- Access to Teaching and Learning Support Services, which provide assistance and guidance, e.g. on careers use of English for writing, Reporting etc.,
- Access to all GSEPS courses, notification of which is provided by email from the Postgraduate Office.
- Maths workshops offered within the Department, co-ordinated by the Postgraduate Tutor, and run by trained GTAs, to support and assist students with weaker mathematical backgrounds and those returning to education from university.

Criteria for admission

The minimum qualification for admission is normally an Upper Second Class Honours degree in either Geology or Civil Engineering from either a UK academic institution or an equivalent institution overseas; alternatively

an Upper Second Class Honours degree in another engineering or a science-based discipline from either a UK academic institution or equivalent institution overseas with relevant experience in geotechnics. The Course Director selects those to whom offers are made. Where an applicant has a lesser degree qualification but has at least 3 years' work experience the Course Director may make a special case for admission if that is appropriate; few such applications are made.

Methods for evaluating and improving the quality and standards of teaching and learning

Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards

- Module reviews, based on feedback questionnaires completed by the students.
- External Examiner reports and Industrial Advisory Board reports.
- MSc Staff – Student Committee, held each term, with report to Departmental Teaching Committee.
- Annual course review prepared by the Course Director and considered by the Course Committee and the Departmental Teaching Committee.
- Biennial review of the course by an Imperial College academic staff member from outside the Department with a report and grading to the Graduate School of Engineering & Physical Sciences Management (or Executive) Committee.
- Biennial staff appraisal.
- Peer teaching observations.
- Periodic review of departmental teaching by an external panel with members drawn from another university, a research institute and industry.

Committees with responsibility for monitoring and evaluating quality and standards

* Board of Examiners – meets in September to consider awards.
* Postgraduate Staff – Student Committee..
* Departmental MSc Teaching Committee
* Departmental Teaching Committee.
* Graduate School of Engineering and Physical Sciences Management (or Executive)Committee.
* Graduate Studies Committee.

Mechanisms for gaining student feedback on the quality of teaching and their learning experience:

* Staff – Student Committee;
* course questionnaire evaluating individual modules and overall course.

Staff development priorities include:

* active research programme in Engineering Geology and geotechnics;
* staff appraisal scheme and institutional staff development courses;
* College Teaching Development Grant Scheme to fund the development of new teaching and appraisal methods;
* updating professional and IT/computing developments

Regulation of assessment

Assessment rules & degree classification

Summary of grades, marks and their interpretation for MSc degree classification

GRADE	MARKS	INTERPRETATION
A	70% - 100%	Marks represent a distinction (truly exceptional or excellent) performance
B	60% - 69%	Marks represent a good pass
C	50% - 59%	Marks represent an acceptable performance at MSc level
D	0% - 49%	Marks represent a fail performance

Role of External Examiner (Visiting Examiner)

The visiting examiners (from other universities and research institutes) are nominated by the MSc Academic Board and approved by the Graduate School of Engineering & Physical Sciences Management (or Executive) Committee. A visiting examiner is appointed for the course; they also review the core course modules. Visiting examiners normally serve for 3 years. The role of visiting examiner is that of moderator. In order to do this they:

* approve examination papers;
* review coursework;
* see all examination scripts and research project dissertations;
* attend the Board of Examiners;
* complete a report to the College;
* provide informal feedback regarding the nature and direction of the Course.

Indicators of quality and standards

* Favourable comments by External Examiners;
* Favourable comments by alumni in industry;
* Applicants sent to the course by virtue of its reputation;
* Research training in Engineering Geology and related areas.
* Independent review of the quality of the educational provision of the Civil & Environmental
* Engineering Department by the Quality Assurance Agency subject review process.

Please note. This specification provides a concise summary of the main features of the programme and learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if she/he takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the Course handbook. The accuracy of the information contained in this document is reviewed by the College and may be checked by the Quality Assurance Agency for Higher Education (QAA).
Key sources of information about this course can be found in:

* Postgraduate Prospectus, Imperial College of Science, Technology & Medicine which are available on-line at http://www.cv.ic.ac.uk/courses/main.asp) and www.cv.imperial.ac.uk/research/soils/engeo/engeohome page1.html#h

* For details of the Business Management option see
www.cv.ic.ac.uk/courses/msc/pg busman.asp

* For details of the Sustainable Development option see
www.cv.ic.ac.uk/courses/msc/pg sustdev.asp

* MSc Course Handbook (annual) available on request to MSc Course Office: e-mail;
cvenquiries@imperial.ac.uk