PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	MSc
4	**Programme Title**	Geotechnical Engineering
5	**UCAS/Programme Code**	5042
6	**Programme Accreditation**	JBM
7	**QAA Subject Benchmark(s)**	Engineering
8	**FHEQ Level**	7
9	**Last updated**	June 2010

10 Programme Aims

1 The primary purpose of this programme is to provide graduate civil engineers and geoscientists with advanced conceptual understanding, detailed factual knowledge, and specialist technical skills appropriate for a successful career as a geotechnical engineer in the construction, mineral extraction and/or environmental industries.

2 The programme is also designed to be capable of taking graduates of other numerate disciplines, such as geophysics, engineering, physics and mathematics, and converting them into skilled geotechnical engineers. To this end, the programme addresses:

(i) the principles of geotechnical engineering, and their application in a range of contexts (including civil engineering, mineral extraction and environmental)
(ii) soils and rocks and their engineering properties
(iii) the site investigation, testing, interpretation and reporting process
(iv) key aspects of geotechnical design, e.g. foundations, slopes, retaining walls
(v) the application of mathematical methods and computational tools in geotechnical engineering

3. In addition to these academic and technical skills, the programme also aims to equip its graduates with a suite of transferable skills, including the ability to communicate effectively, the ability to employ IT and library resources appropriately, the ability to prioritise work and to meet deadlines, the ability to work alone and with others, and the ability to use initiative and to solve problems.

Programme Learning Objectives
On successful completion of the programme, students will have acquired a much deeper knowledge and understanding of Geotechnical Engineering than would be expected at undergraduate level, together with many new skills.

Specifically, students will have gained:

- An advanced knowledge and understanding of the principles of Geotechnical Engineering and of their applications in a civil engineering context
- An advanced knowledge and understanding of the engineering properties and characteristics of soils and rocks
- An advanced knowledge and understanding of the site investigation process from design, through testing and interpretation, to reporting
- An advanced knowledge and understanding of the geotechnical design process, and of the design of foundations, slopes and retaining walls
- A knowledge and understanding of the application of appropriate mathematical methods and IT tools, in Geotechnical Engineering
- A knowledge and understanding of construction practice and an awareness of

requirements for safe operation.

- The ability to identify the geological data relevant to a given engineering scenario, generate such data from field observation or through the employment of appropriate laboratory testing techniques, and interpret these data in an engineering context
- The ability to skilfully employ appropriate numerical methods for modelling and analysing problems in Geotechnical Engineering
- The ability to select and apply ideas, concepts and data, from both science and engineering, in order to generate creative and innovative designs which provide optimal solutions to geotechnical problems
- The ability to skilfully employ appropriate software to support the design of these solutions
- The ability to evaluate the quality of engineering geological data collected through the use of testing and measurement equipment in field and laboratory environments
- The ability to present and summarise such data, and to critically appraise its significance, using numerical techniques
- The ability to critically assess the value and limitations of existing information on a given subject
- The ability to formulate or recognise key hypotheses, to test hypotheses using logical and consistent quantitative or qualitative arguments, and to identify key data which allow such tests to be made
- The ability to critically assess the value and limitations of new data in relation to existing information on a given subject, to draw logical conclusions, and to identify appropriate avenues for further study
- The ability to solve problems
- The ability to communicate by means of well prepared, clear and confident presentations and concise and grammatical written documents
- The ability to use library and other information sources skilfully and appropriately
- The ability to use IT resources skilfully and appropriately
- The ability to plan, organise and prioritise work activities in order to meet deadlines
- The ability to work independently, with initiative, and also in teams

11 Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have references to the benchmark statements for Engineering (X).

Knowledge and Understanding

On completing the programme students should have:

A1 An advanced knowledge and understanding of the principles of geotechnical engineering and their applications in a civil engineering, environmental and extractive industries context

A2 An advanced knowledge and understanding of the engineering properties and characteristics of soils and rocks

A3 An advanced knowledge and understanding of the application of mathematical methods in geotechnical engineering

A4 A knowledge and understanding of aspects of construction practice and an awareness of requirements for safe operation.

A5 A knowledge and understanding of the application of geotechnical design processes in specific site developments

A6 A knowledge and understanding of the applications of computational methods in geotechnical engineering

Teaching and Learning Methods

Specialist technical knowledge and understanding (A1-A6) are primarily imparted through lecture classes, many of which involve lecturers from industry. Key concepts (A1, A2) are introduced in CEG8201 (Geomechanics) and are developed in CEG8202 (Ground Investigation), CEG8203 (Geotechnical Design) and in CEG8205 (Soil Modelling and Numerical Methods). Mathematical methods (A3) are addressed in CEG8201

(Geomechanics), CEG8205 (Soil Modelling and Numerical Methods, and CEG8206 (Engineering and Applied Geology) plus several other technical modules. Outcomes A4, A5 and A6 are taught through CEG8202 (Ground Investigation), and CEG8203 (Geotechnical Design).

Lectures are supported by a range of field trips and site visits (A1-A2; e.g. CEG8202 (Ground Investigation), CEG8206 (Engineering and Applied Geology), CEG8207 (Field Class)), tutorials (A2, A3, A4 A6; CEG8201 (Geomechanics), CEG8203 (Geotechnical Design), CEG8205 (Soil Modelling and Numerical Methods), CEG8206 (Engineering and Applied Geology)), laboratory and other practical activities (A2, A4; CEG8201 (Geomechanics), CEG8204 (Ground Improvement Techniques)), and coursework projects (A3-A6; CEG8202 (Ground Investigation), CEG8203 (Geotechnical Design), CEG8205 (Soil Modelling and Numerical Methods), CEG8608 (Contaminated Land)).

Throughout the taught component of the course, students are encouraged and expected to engage in independent reading, and are supported in this by the provision of individual module reading lists. Observations and discussions on field trips and site visits (A1-A2; e.g. CEG8202 (Ground Investigation), CEG8206 (Engineering and Applied Geology), CEG8207 (Field Class)), active participation in tutorials and practical classes (A2, A4; CEG8201 (Geomechanics), CEG8204 (Ground Improvement Techniques) and engagement in coursework projects (A3-A6; CEG8202 (Ground Investigation), CEG8203 (Geotechnical Design), CEG8205 (Soil Modelling and Numerical Methods), CEG8608 (Contaminated Land)) all assist in the development of understanding.

Assessment Strategy

Formative assessment occurs through tutorial examples and coursework. For summative purposes, unseen examinations and project-based coursework are employed to assess factual knowledge and understanding.

Coursework involves both written and oral presentations. Some, or all, of A1-A6 (depending on topic) are also examined by means of a dissertation and presentation.

Intellectual Skills

On completing the programme students should be able to:
B1 Select and apply appropriate mathematical methods for modelling and analysing problems in geotechnical engineering
B2 Use scientific principles to demonstrate creative and innovative ability in the syntheses of solutions and in formulating designs for remediation of geotechnical problems
B3 Use scientific principles in the modelling and analysis of systems and processes of importance to the geotechnical engineer
B4 Produce solutions to problems through the application of engineering knowledge and understanding
B5 Undertake technical risk evaluation.

Teaching and Learning Methods

Understanding and experience of the analytical and testing techniques used in geotechnical engineering (B1), are provided in the lectures, laboratory and other practical classes of modules such as CEG8201 (Geomechanics) and CEG8202 Ground Investigation. Numerical skills (B1, B2) are formally taught in lectures (CEG8205 (Soil Modelling and Numerical Methods), CEG8203 (Geotechnical Design), CEG8206 (Engineering and Applied Geology)) and computer-based practical classes (CEG8203 (Geotechnical Design), CEG8205 (Soil Modelling and Numerical Methods)), and are practised in the design exercises of CEG8203 Geotechnical Design. This last module also allows students to develop advanced geotechnical design skills (B3) and to become familiar with design software (B4).

Students are encouraged to acquire skills B1 and B2 through reflection on lectures, and active participation in the laboratory, and other practical classes, of modules such as CEG8201 (Geomechanics) and CEG8204 (Ground Improvement Techniques). The lectures and design exercises of CEG8203 (Geotechnical Design) allow students first to acquire, and then practise, their design skills (B3, B4). Familiarity with B1-B5 is reinforced, and further

developed, as students apply their new skills to the analysis and solution of a real problem during CEG8299 (MSc Project and Dissertation in Geotechnical Engineering and Engineering Geology).

Assessment Strategy

Subject specific and practical skills (B1-B5) are assessed by means of coursework exercises (e.g. calculations, design exercises, technical reports) and by unseen written examination. Some, or all, of B1-B5 (depending on topic) are also examined by means of a dissertation and presentation.

Practical Skills

On completing the programme students should be able to:

C1 Evaluate the quality of geotechnical data collected through the use of testing and measurement equipment in field and laboratory environments

C2 Present and summarise such data, and to appraise critically its significance, using numerical techniques

C3 Critically assess the value and limitations of existing information on a given subject

C4 Formulate or recognise key hypotheses, to test hypotheses using logical and consistent quantitative or qualitative arguments, and to identify key data which allow such tests to be made

C5 Critically assess the value and limitations of new data in relation to existing information on a given subject, to draw logical conclusions, and to identify appropriate avenues for further study

C6 Solve problems

Teaching and Learning Methods

Practical skills C1-C6 are developed during the site investigation and design exercises of CEG8202 (Ground Investigation), and CEG8203 (Geotechnical Design); C3, C4, and C6 in the initial desk-based research and planning phases, and C1, C2, C5 and C6 in the subsequent interpretative phases. Elsewhere in the programme, material taught as part of CEG8299 (MSc Project and Dissertation in Geotechnical Engineering and Engineering Geology) addresses C2-C5, whilst tutorials, field exercises and attendance at School research seminars enable skills C3-C6 to be developed further. All such skills are exercised significantly during the course of CEG8299 (MSc Project and Dissertation in Geotechnical Engineering and Engineering Geology).

Students are encouraged to acquire skills during practical site investigation exercises by analysis of information during the desk-based research phase (C3); by designing an investigation strategy for the site, which addresses the issues identified (C4); by appraising the quality of any data collected or provided (C1, C2); and by reflection upon the value of these data, and upon the conclusions to which they lead (C5). Problem solving skills (C6) are employed at all stages of the programme. Students are also expected to acquire cognitive skills by simulating designs using computer models (C3-C6), by reflection on field exercises (C3-C6) and by discussion of scientific presentations following School research seminars (C3-C5). The lengthy dissertation project (CEG8299 (MSc Project and Dissertation in Geotechnical Engineering and Engineering Geology)) encourages the development of practical skills by similar means, but at a more advanced academic level.

Assessment Strategy

Practical skills (C1-C6) are assessed by means of coursework in the form of site investigations, laboratory classes and reports, and written examinations. Some, or all, of C1-C6 (depending on topic) are also examined by means of a dissertation and presentation.

Transferable/Key Skills

On completing the programme students should be able to:

D1 Communicate by means of well prepared, clear and confident presentations and concise and grammatical written documents

D2 To use library and other information sources skilfully and appropriately

D3 To use IT resources skilfully and appropriately

D4 To plan, organise and prioritise work activities in order to meet deadlines

D5 To work independently, with initiative, and also in teams as required.

D6 To solve problems

Teaching and Learning Methods

Key skills D1-D4 are formally taught in CEG8299 (MSc Project and Dissertation in Geotechnical Engineering and Engineering Geology). Management of workload in order to meet deadlines (D4) is also promoted by means of coursework deadlines, whilst team working skills (D5) are developed by group exercises CEG8201 (Geomechanics), CEG8202 Ground Investigation, CEG8206 (Engineering and Applied Geology) and CEG8608 (Contaminated Land). These also provide opportunities for students to improve their problem-solving abilities (D6), and to extend their communication, library, IT, and time management skills (D1-D4). CEG8299 (MSc Project and Dissertation in Geotechnical Engineering and Engineering Geology) provides students with further opportunities to develop all of these skills (D1-D6)

CEG8299 (MSc Project and Dissertation in Geotechnical Engineering and Engineering Geology) provides similar opportunities for skill development through the construction of a research brief (D4), during the literature-search and data-handling components (D2, D3), and as the field and laboratory work is performed (D5, D6).

Assessment Strategy

Key skills (D1-D4) are assessed via written examinations, the production of a research brief, and the giving of short presentation in CEG8299 (MSc Project and Dissertation in Geotechnical Engineering and Engineering Geology). Communication (D1), library (D2) and IT (D3) skills, and the ability to meet deadlines (D4) work independently (D5) and solve problems (D6) are indirectly assessed by other coursework items (e.g. map exercises, technical reports, design projects), and all key skills (D1-D6) are examined by means of a project dissertation

12 Programme Curriculum, Structure and Features

Basic structure of the programme

Following induction, and introductory sessions, the technical modules which make up the taught component of this programme lead the student sequentially and logically from the principles of geotechnical engineering through to its applications, and complete the conversion of relatively inexperienced graduates into competent consultants.

The taught component of the course which commences with CEG8201 (Geomechanics), followed by CEG8202 (Ground Investigation), CEG8203 (Geotechnical Design), CEG8204 (Ground Improvement Techniques), CEG8205 (Soil Modelling and Numerical Methods), CEG8511 (Groundwater Assessment), CEG8608 (Contaminated Land), CEG8106 (Groundwater Contamination and Remediation), CEG8206 (Engineering and Applied Geology) and CEG8207 (Field Class) provide the key geotechnical skills (A1 and A2), describe the site investigation process (A3), and provide training in the theory and practice of geotechnical design and its application in the site investigation and redevelopment process (A4-A6, B1-B4). The design projects occurring here are also used as a framework within which students' cognitive skills (C1-C6), team-working skills (D5), and their problem-solving abilities (C6, D6) are developed.

The taught component of CEG8299 (MSc Project and Dissertation in Geotechnical Engineering and Engineering Geology) introduces the generic skills required in order to successfully initiate, carry out, and report on a significant research project and provides training in the use of appropriate statistics for data analysis and interpretation (C2-C5, D1-D4). CEG8299 commences in Semester 1 and enables students to apply the subject specific skills and understanding (intended learning outcomes A1-A6), the practical skills (intended learning outcomes B1-B4),the cognitive skills (intended learning outcomes C1-C6) and the key skills (intended learning outcomes D1-D6) gained during the taught component, to a geotechnical engineering research problem. Dissertations often involve a significant laboratory component, but may take the form of a field study or numerical modelling work.

Key features of the programme (including what makes the programme distinctive)

This is a one-year full-time modular programme. It consists of two parts: a 100-credit *taught component*, which runs from late September until Easter, and an 80-credit *research project*, for which a dissertation is submitted in August. Successful completion of the taught component is required in order for a student to progress to the dissertation project.

The preferred taught component of the course consists of the following modules: CEG8201 (Geomechanics), CEG8202 (Ground Investigation), CEG8203 (Geotechnical Design), CEG8204 (Ground Improvement Techniques), CEG8205 (Soil Modelling and Numerical Methods), CEG8511 (Groundwater Assessment), CEG8608 (Contaminated Land), CEG8106 (Groundwater Contamination and Remediation), CEG8206 (Engineering and Applied Geology) and CEG8207 (Field Class) all of which are 10-credit modules. Each 10-credit module equates to 100 hours of learning time.

Students interested in aspects of Climate Change and its relationship to Geotechnical Engineering practice may choose to optionally replace modules CEG8106 (Groundwater Contamination and Remediation) and CEG8511 (Groundwater Assessment) with CEG8505 (Climate Change: Earth System, Future Scenarios and Threats) and CEG8514 (Climate Change: Vulnerability, Impacts and Adaptation).

Students interested in business and consultancy aspects of the geotechnical engineering industry may choose to optionally replace modules CEG8106 (Groundwater Contamination and Remediation) and CEG8511 (Groundwater Assessment) with CEG8004 (Enterprise for Construction) (20-credits).

An innovative feature is that all technical modules are taught in short (generally one or two-week) blocks. These occupy students, largely full-time, until the module has been completed and students then progress to the next module. This structure enhances student learning by allowing later units to build on the concepts, knowledge and skills gained during those taught earlier.

Research projects (CEG8299) are often laboratory based, but may also involve field studies or numerical modelling work. During the project, students are usually based in the School, perhaps working in one of our established research groups, but the dissertation might entail working elsewhere, in collaboration with another industrial or academic partner. Students are encouraged and given support if they wish to seek publication of the results/findings of their dissertations.

Programme regulations (link to on-line version)

http://www.ncl.ac.uk/regulations/programme/

13 Criteria for admission

Entry qualifications

An upper-second-class Honours degree, or an international equivalent, in civil engineering or geology is preferred; other degrees in related disciplines are considered, as is work experience.

Admissions policy/selection tools

Non-standard Entry Requirements

Applicants who hold non-standard qualifications, and/or have relevant experience, are considered on an individual basis.

Additional Requirements

Level of English Language capability
IELTS 6.5 (or equivalent) in all components

14 Support for Student Learning

The Student Services portal provides links to key services and other information and is available at: *http://www.ncl.ac.uk/students/*

Induction
During the first week of the first semester students attend an induction programme. New students will be given a general introduction to University life and the University's principle support services and general information about the School and their programme, as described in the Degree Programme Handbook. New and continuing students will be given detailed programme information and the timetable of lectures/practicals/labs/ tutorials/etc. The International Office offers an additional induction programme for overseas students.

Study skills support
Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Some of this material, e.g. time management is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Numeracy support is available through Maths Aid and help with academic writing is available from the Writing Centre (further information is available from the Robinson Library).

Academic support
The initial point of contact for a student is with a lecturer or module leader, or their tutor (see below) for more generic issues. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Staff-Student Committee, and/or at the Board of Studies.

Pastoral support
All students are assigned a personal tutor whose responsibility is to monitor the academic performance and overall well-being of their tutees. In addition the University offers a range of support services, including one-to-one counselling and guidance or group sessions / workshops on a range of topics, such as emotional issues e.g. Stress and anxiety, student finance and budgeting, disability matters etc. There is specialist support available for students with dyslexia and mental health issues. Furthermore, the Union Society operates a Student Advice Centre, which can provide advocacy and support to students on a range of topics including housing, debt, legal issues etc.

Support for students with disabilities
The University's Disability Support Service provides help and advice for disabled students at the University - and those thinking of coming to Newcastle. It provides individuals with: advice about the University's facilities, services and the accessibility of campus; details about the technical support available; guidance in study skills and advice on financial support arrangements; a resources room with equipment and software to assist students in their studies.

Learning resources
The University's main learning resources are provided by the Robinson and Walton Libraries (for books, journals, online resources), and Information Systems and Services, which supports campus-wide computing facilities.

All new students whose first language is not English are required to take an English Language Proficiency Test. This is administered by INTO Newcastle University Centre on behalf of Newcastle University. Where appropriate, in-sessional language training can be provided. The INTO Newcastle University Centre houses a range of resources which may be particularly appropriate for those interested in an Erasmus exchange.

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

Module reviews
All modules are subject to review by questionnaires which are considered by the Board of Studies. Changes to, or the introduction of new, modules are considered at the Board of Studies and/or the School Teaching and Learning Committee. Student opinion is sought at the Staff-Student Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Teaching and Learning Committee.

Programme reviews
The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Teaching and Learning Committee. The FTLC takes an overview of all programmes within the Faculty and reports any Faculty or institutional issues to the University Teaching and Learning Committee.

External Examiner reports
External Examiner reports are considered by the Board of Studies. The Board responds to these reports through Faculty Teaching and Learning Committee. External Examiner reports are shared with institutional student representatives, through the Staff-Student Committee.

Student evaluations
All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Staff-Student Committee, and the Board of Studies. The results from student surveys are considered as part of the Annual Monitoring and Review of the programme and any arising actions are captured at programme and School / institutional level and reported to the appropriate body.

Mechanisms for gaining student feedback
Feedback is channelled via the Staff-Student Committee and the Board of Studies.

Faculty and University Review Mechanisms
The programme is subject to the University's Internal Subject Review process. Every five years degree programmes in each subject area are subject to periodic review. This involves both the detailed consideration of a range of documentation, and a two-day review visit by a review team which includes an external subject specialist in addition to University and Faculty representatives. Following the review a report is produced, which forms the basis for a decision by University Teaching and Learning Committee on whether the programmes reviewed should be re-approved for a further five year period.

Accreditation reports
The programme is accredited for further learning by the Joint Board of Moderators (Institution of Civil Engineers (ICE)), Institution of Structural Engineers (IStructE) and Institution of Highways and Transportation (IHT)). It is reviewed every 5 years following a visit from a JBM review panel made up of academics and professional engineers. The results and feedback from the JBM panel are considered by the Board of Studies.

Additional mechanisms

16 Regulation of assessment

Pass mark
The pass mark is 50%

Course requirements
Progression is subject to the University's Masters Degree Progress Regulations, Taught and Research and Examination Conventions for Taught Masters Degrees. Limited compensation up to 40 credits of the taught element and down to a mark of 40% is possible and there are

reassessment opportunities, with certain restrictions.

The University employs a common marking scheme, which is specified in the Taught Postgraduate Examination Conventions, namely:

Summary description applicable to postgraduate Masters programmes		**Summary description applicable to postgraduate Certificate and Diploma programmes**	
<50	Fail	<50	Fail
50-59	Pass	50 or above	Pass
60-69	Pass with Merit		
70 or above	Pass with Distinction		

Role of the External Examiner
An External Examiner, a distinguished member of the subject community, is appointed by Faculty Teaching and Learning Committee, following recommendation from the Board of Studies. The External Examiner is expected to:

i. See and approve assessment papers
ii. Moderate examination and coursework marking
iii. Attend the Board of Examiners
iv. Report to the University on the standards of the programme

In addition, information relating to the programme is provided in:

The University Prospectus: http://www.ncl.ac.uk/postgraduate/

The School Brochure http://www.ncl.ac.uk/marketing/services/print/publications/ordering/

Degree Programme and University Regulations: http://www.ncl.ac.uk/regulations/docs/

The Degree Programme Handbook (available via the internal webpage)

Please note. This Specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if s/he takes full advantage of the learning opportunities provided. The accuracy of the information contained is regularly reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

Annex

Mapping of Intended Learning Outcomes onto Curriculum/Modules

		Intended Learning Outcomes			
Module	**Type**	**A**	**B**	**C**	**D**
CEG8201	Compulsory	1,2,3,4,5	1,2	1,5	1,2,3,4,5,6
CEG8202	Compulsory	1,2,3,4,5.6	1,2	1,2,3,4,5,6	1,2,3,4,5,6
CEG8203	Compulsory	1,2,3,4,5,6	1,2,3,4	1,2,3,4,5,6	1,2,3,4
CEG8204	Compulsory	2,4	1,2	1,6	1,2,3,4
CEG8205	Compulsory	1,2,3,4,5,6	1,2	5,6	1,2,3,4
CEG8206	Compulsory	1,2,3	1,2	1,2,3,4,5,6	1,2,3,4,5,6
CEG8207	Compulsory	1,2,4,5	2	1,2,4	1,2,3,4
CEG8608	Compulsory				
CEG8299	Compulsory	1,2,3,4,5,6	1,2,3,4,5	1,2,3,4,5,6	1,2,3,4,5,6
CEG8106	Preferred Option				
CEG8511	Preferred Option				
CEG8004	Extra-Optional			3,4,6	1,2,3,4,5,6
CEG8505	Extra-Optional				
CEG8514	Extra-Optional				

Outcomes:

Knowledge and Understanding:

On completing the programme students should have:

A1 An advanced knowledge and understanding of the principles of geotechnical engineering and their applications in a civil engineering and extractive industries context

A2 An advanced knowledge and understanding of the engineering properties and characteristics of soils and rocks

A3 An advanced knowledge and understanding of the application of mathematical methods in engineering

A4 A knowledge and understanding of construction practice (?) and an awareness of requirements for safe operation.

A5 A knowledge and understanding of the application of engineering geology and geotechnical design processes in specific site developments

A6 A knowledge and understanding of the applications of IT in geotechnical engineering

Intellectual Skills:

On completing the programme students should be able to:

B1 Select and apply appropriate mathematical methods for modelling and analysing problems in geotechnical engineering

B2 Use scientific principles to demonstrate creative and innovative ability in the syntheses of solutions and in formulating designs for remediation of geotechnical problems

B3 Use scientific principles in the modelling and analysis of systems and processes of importance to the geotechnical engineer

B4 Produce solutions to problems through the application of engineering knowledge and understanding

B5 Undertake technical risk evaluation.

Practical Skills:

On completing the programme students should be able to:

C1 Evaluate the quality of geotechnical data collected through the use of testing and measurement equipment in field and laboratory environments

C2 Present and summarise such data, and to appraise critically its significance, using numerical techniques

C3 Critically assess the value and limitations of existing information on a given subject

C4 Formulate or recognise key hypotheses, to test hypotheses using logical and consistent quantitative or qualitative arguments, and to identify key data which allow such tests to be made
C5 Critically assess the value and limitations of new data in relation existing information on a given subject, to draw logical conclusions, and to identify appropriate avenues for further study
C6 Solve problems

Transferable/key Skills:

On completing the programme students should be able to:
D1 Communicate by means of well prepared, clear and confident presentations and concise and grammatical written documents
D2 To use library and other information sources skilfully and appropriately
D3 To use IT resources skilfully and appropriately
D4 To plan, organise and prioritise work activities in order to meet deadlines
D5 To work independently, with initiative, and also in teams as required.
D6 To solve problems