PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	MEng (Hons)
4	**Programme Title**	Civil Engineering
5	**UCAS/Programme Code**	H290
6	**Programme Accreditation**	ICE, IStructE, CIHT, IHE
7	**QAA Subject Benchmark(s)**	Engineering
8	**FHEQ Level**	7
9	**Last updated**	May 2011

10 Programme Aims

1. to provide opportunities for students with high academic ability to undertake a multi-theme based education in civil engineering;
2. to provide opportunities for students to acquire appropriate knowledge and understanding, and a range of skills within a set of core themes, together with a sound grasp of engineering design, an appreciation of sustainability issues and a recognition of the importance of health and safety and the need to manage risk;
3. to provide opportunities for students to integrate their knowledge and understanding of mathematics, science, computer-based methods, design, the economic, social and environmental context, and engineering practice to solve a range of complex engineering problems, principally through involvement in individual and group design projects;
4. to produce graduates who are aware of their responsibilities to society and to the environment and are equipped to enter employment in industry, the professions or public service or to follow a postgraduate route into research, industry or academia, or to apply their skills in areas outside of engineering;
5. to produce graduates who will meet the accreditation requirements of the Joint Board of Moderators for Chartered Engineer status;
6. to provide a programme which meets the FHEQ at Masters level and which takes appropriate account of the subject benchmark statement in Engineering.

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 (E).

Knowledge and Understanding

On completing the programme students should have gained knowledge and understanding of:

A1 The essential facts, concepts, theories and principles of civil engineering from basic to enhanced level

A2 The wider multidisciplinary engineering context and its underlying principles (E)

A3 Mathematical principles necessary to underpin their education in civil engineering and to enable them to apply mathematical methods, tools and notations proficiently in the analysis and solution of engineering problems (E)

A4 Client and user needs and the importance of aesthetics (E)

A5 The commercial and economic context within which engineering is practised (E)

A6 The management techniques that may be used to achieve engineering objectives (E)

A7 The requirement for engineering activities to promote sustainable development (E)

A8 The need for a high level of professional and ethical conduct in engineering and an awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues (E)

A9 The characteristics of particular materials, equipment, processes and products typically used in civil engineering (E)

A10 The range of functions civil engineers fulfil in the principal areas where they are employed, together with a detailed understanding of the latest operating practices and the limitations of existing approaches

A11 Appropriate codes of practice and industry standards (E)

A12 Contractual and quality issues

A13 The different roles within a team and the importance of leadership

A14 Developing technologies related to the student's chosen specialism (E)

A15 Mathematical and computer models relevant to civil engineering and an appreciation of their limitations (E)

A16 Management practices and their limitations, as adopted throughout the project cycle

Teaching and Learning Methods

Knowledge and understanding is mainly imparted through lectures, which for some outcomes (parts of A8 and A10), are given by external speakers with particular specialisms. Tutorials are typically used where students need to practise methods and techniques (A1 and A3) and laboratories help to reinforce messages that have been initially conveyed in lectures. The integrated design modules in stages 1 and 2 help students to see the wider picture (A2) and also expose them to a range of other concerns (A4, A5, A7), while site visits aid their appreciation of some of the roles engineers fulfil (A10).

Teamwork (A13) is an important element of the stage 3 multi-disciplinary design project, and the focus in stage 4 on a particular discipline allows students to become conversant with latest developments (A14, A15).

Assessment Strategy

The primary means of assessment of knowledge and understanding is by unseen written examinations. These are supplemented by assessed coursework, consisting mainly of project reports and laboratory reports.

Intellectual Skills

On completing the programme students should be able to:

B1 Apply appropriate quantitative science and engineering principles and tools to the analysis of problems (E)

B2 Demonstrate creative and innovative ability in the synthesis of solutions and in formulating designs, especially within Design for Sustainable Engineering Systems theme (E)

B3 Comprehend the broad picture and thus work with an appropriate level of detail (E)

B4 Plan, conduct and report a major programme of investigative work

B5 Analyse experimental or computational results and determine their strength and validity

B6 Identify, classify and describe the performance of systems and components through the

use of analytical methods and modelling techniques (E)

B7 Investigate and define a problem and identify constraints including environmental and sustainability limitations, social matters, health and safety and risk assessment issues (E)

B8 Manage the design process and evaluate outcomes (E)

B9 Recognise commercial risks and understand how managers can respond

Teaching and Learning Methods

Intellectual skills are acquired through the teaching and learning programme outlined in section 12. In particular, analysis and problem solving skills (B1, B6) are developed through example classes, tutorials and coursework, and design skills are developed through coursework activities and design projects (B2, B8). These include the Design for Sustainable Engineering Systems modules that require students to recognise constraints and to understand the skills needed for both preliminary and detailed design (B3, B7, B9). Experimental results are generated in laboratory work and students are expected to analyse and make sense of their data (B5). All students undertake a major individual project in their final year that will require them to scope a particular project and produce a detailed report (B4).

Assessment Strategy

Written coursework assignments, which include group project reports, laboratory reports and a report on a substantial individual project, are the principal means of assessment for these skills, although some may also be assessed by examinations, which in some circumstances are open book exams.

Practical Skills

On completing the programme students should be able to:

C1 Carry out experiments safely

C2 Use laboratory equipment to generate data

C3 Prepare technical drawings

C4 Apply quantitative methods and computer-based models relevant to civil engineering, to solve engineering problems with an awareness of the limitations of such models (E)

C5 Develop and apply safe systems of work

C6 Identify and manage cost drivers (E)

C7 Ensure fitness for purpose for all aspects of a project including design, construction, operation, maintenance and decommissioning (E)

C8 Produce design solutions for civil engineering projects

C9 Produce project plans and recognise the need to revise and update as circumstances change

C10 Ability to extract data pertinent to an unfamiliar problem, and apply in its solution using computer based engineering tools when appropriate (E)

Teaching and Learning Methods

Students have numerous opportunities to carry out experiments in the School's laboratories, but must attend induction programmes to reinforce the need to conduct themselves safely before beginning work (C1, C2, C5). Specific design skills are developed in a range of disciplines and the Design for Sustainable Engineering Systems modules bring these together, requiring a holistic view of the selected project that includes an awareness of costs and the complete project cycle (C5, C6, C7, C8). Technical drawings are produced as an essential part of these design exercises and students are introduced to CAD systems to enable them to produce professional output (C3). Particular industry-standard software is introduced in the relevant modules, some of which students will have a chance to use themselves (C4).

The multi-disciplinary design project in stage 3 is a team effort that requires groups of students to collect information to develop a solution to the open-ended problem set. This will,

necessarily, involve plans being produced that will later need to be revised in the light of new information (C9, C10).

Assessment Strategy

The ability to use practical skills is mainly assessed by means of written assignments, including drawings, design calculations, laboratory reports, project reports and the report from a substantial individual project.

Transferable/Key Skills

On completing the programme students should be able to:

D1 Communicate effectively in writing, verbally and through drawings and presentations

D2 Gather and use information using Information and Communications Technology

D3 Work with incomplete information and technical uncertainty (E)

D4 Search for and use the scientific literature effectively

D5 Take notes effectively

D6 Work on projects, both individually and as a member of a team

D7 Plan self-learning and improving performance as the foundation for life-long learning (E)

D8 Monitor and adjust a personal programme of work (E)

D9 Independently learn new theories, concepts, methods etc. in unfamiliar situations (E)

Teaching and Learning Methods

Many of the transferable skills are practised in the numerous coursework exercises students must undertake and advice on specific aspects will be given in particular modules (D1, D5). The individual and group projects require students to gather information, search literature and recognise and develop areas where their knowledge may be deficient (D1, D2, D3, D4, D6, D7). Design for Sustainable Engineering Systems coursework is a good example of the above, which is carried out in groups and forces the teams to not only use information they have been given, but also to search out and understand aspects of their designs on which they have received no instruction.

The project in stage 4 will require students to further their understanding in specific specialised areas and to project manage their individual work and report submission (D8, D9).

Assessment Strategy

Most pieces of coursework will include an element to cover transferable skills and a number of modules require students to make oral presentations to an audience, which will also contribute to the assessment for the particular modules. Many of these skills are also assessed in the major individual project that all students undertake.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

The normal Undergraduate year is approximately 31 weeks, arranged in three terms and currently divided into two semesters. The course normally lasts four years (Stages), although it is possible to take a gap year with the approval of the Head of School.

Every Honours student studies 120 credits in each Stage (or year), resulting in MEng candidates completing 480 credits. Candidates must complete one Stage before proceeding to the next; the only part-time study is limited provision for the repetition of failed modules. There is a Faculty Foundation Year for candidates not adequately qualified to embark on

Stage 1 of engineering degree programmes.

Modules in Stages 1, 2 and 3 are all compulsory. In Stage 4 students have choices in 60 of the 120 credits.

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

The Civil Engineering Programme is a systems-based integrated programme with sustainable development at its heart, engaging with the environmental, social and economic dimensions of this unifying concept in the design, implementation, and rehabilitation of all civil engineering interventions within the Earth system. It challenges students to think not only about the technically demanding subjects but also about the future challenges of climate change, sustainable development, democracy, equity, poverty alleviation, and the lifelines of energy, food and water.

To this end, the Programme is delivered under five themes: Modelling and Information Systems; Infrastructure Systems; Environmental Systems; Human and Management Systems; and Design of Sustainable Engineering Systems (DSES). DSES is central to the Programme, which challenges the students to integrate all of the knowledge gained in the four other themes within a holistic sustainable development framework that focuses on the delivery of sustainable solutions at a range of scales, from individual structures to whole cities. Within the themes at Stages 1 to 3, the programme provides a basis in each of the disciplinary pillars on which the training of all civil engineers must be founded, with an opportunity to specialise in one of four disciplines (geotechnics, transport, water, environmental engineering) for a substantial part of Stage 4, including an individual research project. (There is a separate Civil and Structural Engineering Degree Programme for those that enter wishing to specialise in the structures discipline).

In designing and delivering the Programme, strong links with industry are crucial to ensure that our programme is aligned with industry trends and that graduates emerge with the skill sets that industry needs and the capacity to tackle the challenge of sustainable development in the 21st century. In particular, Andy Mace from Arup's Newcastle office, who played a leading role in the Dongtan Eco-city project in China, was established as a Royal Academy of Engineering Visiting Teaching Fellow, to enable close industrial interaction with our DSES modules. Our many other industrial collaborators also provide guest speakers, site visits, project support, and an increasing number of industrial placements.

Students who successfully graduate from this programme will have met the accreditation requirements of the Joint Board of Moderators for Chartered Engineer status. From the start of the Programme, students are encouraged to become student members of ICE/IStructE.

For students that can demonstrate suitable performance and motivation by the end of Stage 2, there are opportunities to study Stage 3 abroad at an approved institution that offers suitable civil engineering modules taught in English (e.g. Sweden, Singapore and Colorado).

Programme regulations (link to on-line version)

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

13 Criteria for admission

Entry qualifications

A Levels

AAA including Mathematics and excluding General Studies. Preference will be given to applicants with mathematical or science-based A levels. GCSE Physics or Dual Award Science (minimum grade B) required if not offered at A or AS level.

Scottish Qualifications

AA at Advanced Higher including Mathematics. Preference will be given to applicants with mathematical or science-based Advanced Highers. Physics required at grade 2 Standard Grade (or Intermediate 2 equivalent) if not offered at Higher or Advanced Higher.

Admissions policy/selection tools

Selection is not judged on academic performance alone. Special cases, for example mature students, students who have achieved a position of authority, students who have worked in the construction industry or in developing countries, or students who come through the PARTNERS route are considered separately on their individual merit.
Some undergraduate students are accepted onto our undergraduate degree programmes with non-A level qualifications. The equivalence of these "non-standard" qualifications are discussed widely at Faculty level, and are set on an annual basis to reflect changes to the qualifications, and also based on our experience of students having gone through the system with such qualifications.

UCAS application forms are received and processed initially by the University's central Admissions Office, and the data is transferred to their database. From there, the forms are sent directly to the Admissions Tutor, or Selector, for the undergraduate programmes. On receipt of the UCAS application forms, the Admissions Tutor makes an initial assessment of the application based on the information supplied on the UCAS application form, that is, on predicted grades, the applicant's personal statement, the referee's report and whether the applicant had any relevant work experience. Applicants who have already achieved their qualifications, but are taking a gap year, are immediately made an offer of a place if they meet our entry criteria. They then receive an invitation to one of our Open Days. UK applicants who have yet to complete their qualifications are invited to an interview, which also forms part of our Open Day. A decision is made directly after the interview, or in the couple of days following interview, and the applicant informed of the decision directly. One of the main reasons we use this approach is to improve our conversion rate and to improve our entry qualifications. International applicants are made an offer on receipt of their application and are sent a Newsletter giving them appropriate information about the courses, the University and the city, with the invitation to visit informally if they are in the UK prior to starting their studies.

The Open Days and interviews are run to allow applicants to visit and for both parties to make an informed choice. They are also the ideal forum for dealing with applicants' queries, introducing them to life in Newcastle, and establishing their interest and motivation in becoming a professional civil engineer. The Open Day begins with an ice-breaking team-based problem-solving exercise. After a welcome talk, applicants are then interviewed, given a guided tour around the School, campus and city, and shown a number of small presentations from University staff on financial, careers and similar issues. Current students are heavily involved in the tours, which allows our visitors to gain a realistic vision of life as a civil engineering student at Newcastle.

The engineering Schools within the Faculty of Science, Agriculture and Engineering (SAgE) have a wealth of experience of recruiting international students. Our international offers are based on this knowledge.

Students are permitted to transfer from BEng to MEng at initial registration if they applied for the BEng and were offered a place on the BEng, which they accepted, but have achieved the entry requirements for the MEng and want to change. The Admissions Tutor authorises the transfer, then the School registers the student on the MEng programme. Students are not allowed to transfer after this point until the end of their second year, when their performance is assessed and meets the transfer criteria.

Non-standard Entry Requirements

International Baccalaureate

37 points with Mathematics at Higher Level grade 5 or above. Physics required at Standard Level grade 6 or above if not offered at Higher Level.

Irish Leaving Certificate

Exceptional applicants may be considered for direct entry into Stage 1, provided they meet a very high standard. Such applicants must have achieved all As at higher level, with at least 3 As in mathematical and science subjects. All other candidates will be considered for foundation year entry. All applications will be considered on an individual basis.

Access Qualifications

Candidates will be considered for BEng or foundation year entry only. Please see BEng or Engineering with Foundation Year for specific entrance requirements.

BTEC National Diploma

Candidates offering the BTEC National Diploma will be considered for Foundation Year entry only. Please see Engineering with Foundation Year for specific entrance requirements.

BTEC Higher National Diploma

Overall Distinction grades with Distinction in mathematics and science units. Units must include both Analytical Methods and Further Analytical Methods. Students studying the HND outside of the UK, and who have studied subjects corresponding in syllabus and level to Stage 1 of the degree and with Distinction in Mathematics and other engineering subjects, may be considered for Stage 2 entry.

PARTNERS - A Levels

AAB including Mathematics and excluding General Studies. Preference will be given to applicants with mathematical or science-based A levels. GCSE Physics or Dual Award Science (minimum grade B) required if not offered at A or AS level.

PARTNERS - BTEC National Diploma

Candidates offering the BTEC National Diploma will be considered for Foundation Year entry only. Please see Engineering with Foundation Year for specific entrance requirements.

Advanced Diploma MEng

Advanced Diploma in Construction and the Built Environment or in Engineering acceptable. Grade A in the Principal Learning and Extended Project required, and A level Mathematics at grade A, or equivalent. For Construction and Built Environment, GCSE Dual Award Science (minimum grade BB) also required.

Foundation Degrees

Candidates will be considered on an individual basis – please see BTEC Higher National Diploma for entry standards.

Other Qualifications

Other qualifications are considered on an individual basis.

Direct Entry Students

Direct entry to Stage 2 of the undergraduate degree programmes is possible for candidates with the appropriate qualifications, both from home and internationally.

The University now operates an Accreditation of Prior Learning (APL) Policy which allows Admissions Tutors and Degree Programme Directors to admit students into any of the later Stages, providing the level of their knowledge and skills is appropriate. Details of the APL policy can be seen at http://www.ncl.ac.uk/aqss/qsh/APEL_Policy.pdf

Additional Requirements

Mathematics and Physics or Dual Award Science are required at GSCE Level, minimum Grade B.

Level of English Language capability
IELTS 6.5 (or equivalent)

14 Support for Student Learning

The Student Services portal provides links to key services and other information and is available at: *https://my.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, Learning and Student Experience Committee.

Programme reviews
The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Teaching, Learning and Student Experience Committee. The FTLSEC 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, Learning and Student Experience 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 National Student Survey is sent out every year to final-year undergraduate students, and consists of a set of questions seeking students' views on the quality of the learning and teaching. 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, Learning and Student Experience Committee on whether the programmes reviewed should be re-approved for a further five year period.

Accreditation reports

This degree programme is accredited by the Joint Board of Moderators (Institution of Civil Engineers, Institution of Structural Engineers, Chartered Institution of Highways and Transportation, and the Institute of Highway Incorporated Engineers) as fully satisfying the educational base for a Chartered Engineer (CEng). See http://www.jbm.org.uk for further information.

Additional mechanisms
Strategic and pedagogical review takes place annually via School Teaching Away Days.

16 Regulation of assessment

Pass mark
The pass mark is 40%

Course requirements
Progression is subject to the University's Undergraduate Progress Regulations and Undergraduate Examination Conventions. In summary, students must pass, or be deemed to have passed, 120 credits at each Stage. Limited compensation up to 40 credits and down to a mark of 35% is possible at each Stage and there are re-assessment opportunities, with certain restrictions.

Weighting of stages
The marks from **Stages 2, 3 and 4** will contribute to the final classification of the degree
The weighting of marks contributing to the degree for **stage 2 is 16.7% stage 3 is 33.3% and stage 4 is 50.0%**

Common Marking Scheme
The University employs a common marking scheme, which is specified in the Undergraduate Examination Conventions, namely

	Modules used for degree classification (DC)	**Modules not used for degree classification**
<40	Fail	Failing
40-49	Third Class	Basic
50-59	Second Class, Second Division	Good
60-69	Second Class, First Division	Very Good
70+	First Class	Excellent

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, including project quality
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/undergraduate/

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

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 she/he takes full advantage of the learning opportunities provided. The accuracy of the information contained is 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**
STAGE 1					
CEG1001	Compulsory	2,4,5,6,7,8	2,3,4,7,8	3,4,6,7,8	1,2,3,4,6,7
CEG1003	Compulsory	2,4,5,7,8	3,7	6	1,2,4,5,7
CEG1101	Compulsory	1,2,7,8,9	1,6,7	1,2,5	1,2,5,7
CEG1201	Compulsory	1,9	5,7	1,2,5	1,2,5,7
CEG1301	Compulsory	1,3,9	1,5,6	1,2,4,5	1,2,5,7
CEG1501	Compulsory	1,2,9	1,5	1,2,4,5	1,2,5,7
CEG1709	Compulsory	1,12	1	1,2,5	2,5,6,7
CEG1710	Compulsory	3,9,10	1,3,5	4	1,2,6
ENG1001	Compulsory	3	1		1,5,7
STAGE 2					
CEG2001	Compulsory	2,4,5,6,7,8,9	2,3,4,7,8	3,6,7,8	1,2,3,4,6,7
CEG2002	Compulsory	3	1,5,6	4	1,2,5,7
CEG2003	Compulsory	3	1,5,6	4	1,2,5,7
CEG2101	Compulsory	1,8,9,11	1,2,7,8	1,2,8	1,2,3,4,5,7
CEG2201	Compulsory	1,8,9,10	1,3,5,6,7	1,2,4,7	1,2,3,5,7
CEG2301	Compulsory	1,3,9,11	1,6	7	1,2,5,7
CEG2302	Compulsory	1,3,8,9,11	1,3,6,7	1,2,5,7,8	1,2,5,7
CEG2401	Compulsory	1,2,4,5,7,8,11	1,3,6,7	4,7,8	1,2,4,5,7
CEG2501	Compulsory	1,2,3,9	1,3,5	2,4	1,2,5,7
CEG2712	Compulsory	1,3,10	1,3,5	1,2	1,2,5,6,7
STAGE 3					
CEG3001	Compulsory	2,4,5,6,7,8	2,3,7,8	3,6,8	1,2,3,4,6,7
CEG3002	Compulsory	4,5,6,8,9,10,11,12	2,3,7	5,6,7	1,2,3,4,5,7
CEG3003	Compulsory	5,7,8	7		1,2,4,5,6,7
CEG3201	Compulsory	1,2,7,8,9,10,11	1,2,3,7,8	4,7,8	1,2,3,5,6,7
CEG3301	Compulsory	1,9,10,11	1,2,6,8	3,4,7,8	1,2,5,6,7
CEG3305	Compulsory	1,3,11	1,6	4	1,2,5,7
CEG3401	Compulsory	2,4,5,7,8,9,10,11	1.3.6.7	3,4,7,8	1,2,3,4,5,7
CEG3503	Complusory	2,5,7,8	2,3,7	2,6	1,2,4,5,6,7
CEG3004	Compulsory	2,4,5,6,7,8,9,10,13	1,2,3,7,8	3,6,7,8,9,10	1,2,3,4,6,7,9
STAGE 4					
CEG8002	Compulsory	4,5,6,8,10,12,13,16	3,7,9	5,6,7,9,10	1,2,5,6,7,9
CEG8003	Compulsory	4,5,7,8,10,13	2,7	6,10	1,2,4,6,7,8,9
CEG8099	Compulsory	8,14	1,2,3,4,5,7	1,2,5,9,10	1,2,3,4,6,7,8,9
CEG8004	Optional	4,5,6,8,12,13,16	2,7,8,9	6,7,9,10	1,2,4,6,7,8,9
NCL8007	Optional	4,8	2		1,2,6,7,8,9
STAGE 4 ENVIRONMENTAL ENGINEERING OPTION					
CEG8105	Optional	2,4,5,6,7,8,9,10,11,14,16	7,9	6,10	1,2,4,5,7,8,9
CEG8107	Optional	2,4,5,7,8,9,10,14	2,3,7	7,8,9,10	1,2,3,4,5,6,7,8,9
CEG8405	Optional	2,4,7,8,14,15	1,6,7	4,7,10	1,2,3,4,5,7,8,9
CEG8608	Optional	2,7,8,9,10,13,14,15	1,4,6,7	4,5,9,10	1,2,4,5,6,7,8,9
STAGE 4 GEOTECHNICAL ENGINEERING OPTION					
CEG8204	Optional	2,4,7,8,9,10,11,14,16	3,6,7	4,5,6,7,8	1,2,3,4,5,7,8,9
CEG8205	Optional	2,3,9,13,15	1,3,5,6,7	4,10	1,2,3,4,5,6,7,8,9
CEG8206	Optional	2,7,8,9,10,14	1,3,5,6,7	2,7,9,10	1,2,3,4,5,7,8,9
CEG8608	Optional	2,7,8,9,10,13,14,15	1,4,6,7,9	4,5,9,10	1,2,4,5,6,7,8,9
STAGE 4 TRANSPORT ENGINEERING OPTION					
CEG8405	Optional	2,4,7,8,14,15	1,6,7	4,7,10	1,2,3,4,5,7,8,9
CEG8406	Optional	2,4,5,6,7,8,10,14	6,7	6,7,10	1,2,4,5,6,7,8,9
CEG8411	Optional	4,5,7,8,10	7	6,7,10	1,2,4,6,7,8,9
CEG8412	Optional	4,5,6,7,8,16	6,7,9	6,7,9,10	1,2,4,5,6,7,8,9

STAGE 4 WATER RESOURCES ENGINEERING OPTION					
CEG8505	Optional	2,7,15	1,3,6,7,9	4,10	1,2,3,4,5,7,8,9
CEG8511	Optional	2,3,7,9,10,14	1,2,5,6,7	10	1,2,3,4,5,7,8,9
CEG8512	Optional	2,5,7,8,10,13,14,15,16	1,2,3,6,7	4,6,9,10	1,2,3,4,5,6,7,8,9
CEG8515	Optional	2,7,10,14,15	1,3,5,6	4,10	1,2,3,4,5,6,7,8,9