UNIVERSITY
OF
NEWCASTLE UPON TYNE

DEGREE PROGRAMME SPECIFICATION

1.Awarding Institution:	University of Newcastle upon Tyne
2.Teaching Institution:	University of Newcastle upon Tyne
3. Programme Accredited by:	ICE, IStructE
4. Final Award:	M.Eng. (Hons.)
5. Programme Title:	Civil Engineering
6. UCAS codes:	H290
7. QAA Benchmarking Group	Engineering
8. Date of production / revision	December, 2004

9. Educational Aims of the Programme

The programme aims:

- to provide opportunities for students to undertake a broad-based education in civil engineering;
- to provide opportunities for students to acquire appropriate knowledge and understanding, engineering skills and key skills, together with an appreciation of both general and construction-related management issues;
- to produce graduates who: have a thorough knowledge and understanding of civil engineering; are aware of their responsibilities to society and to the environment; are equipped to enter employment in industry, the professions or public service or to follow a postgraduate route into research, industry or academia, or apply the skills learnt in a range of areas other than engineering;
- to produce graduates who will meet the accreditation requirements of the Joint Board of Moderators for Chartered Engineer status;
- to provide a qualification which meets the designated learning outcomes at level 4 of the National Qualifications Framework and meets the requirements of the National Subject Benchmarks in Engineering.

10. Programme 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).

A Knowledge and understanding

Knowledge and understanding of:

1. Basic Mathematics and Science that are relevant to Civil Engineering (E);
2. The fundamental concepts, principles and theories of Civil Engineering (E);
3. Business and management techniques that are relevant to construction and other industries (E);
4. Essential facts, concepts, principles and theories, at an advanced level, relevant to the student's chosen area of specialisation within Civil Engineering (E);
5. The role of civil engineers in society and the constraints within which their engineering judgement will be exercised (E);
6. The professional and ethical responsibilities of civil engineers (E);
7. The environmental issues that affect Civil Engineering and the issues associated with sustainable engineering solutions;
8. Conceptual, elemental and detailed design of Civil Engineering structures and systems;
9. Construction practice including codes of practice, design, the assessment of safety risks, and the legislative framework for safety.

Teaching/learning methods and strategies

Acquisition of 1 and 2 is through a combination of lectures, tutorials, example classes, laboratory experiments, coursework and projects in Stages 1 and 2.

Acquisition of 3 is through a combination of lectures, supervisions, coursework, fieldtrips and projects in Stages 3 and 4.

Acquisition of 4 is through a combination of lectures, laboratory experiments, coursework and projects in Stages 3 and 4.

Acquisition of 5 and 6 is through lectures throughout the programme and coursework in Stage 3.

Acquisition of 7 is through a combination of lectures, seminars, coursework and projects especially in Stages 3 and 4.

Acquisition of 8 is through the integrated design projects in Stages 1, 2 and 3 and lectures and coursework in Stages 2, 3 and 4.

Acquisition of 9 is specifically through lectures in Construction Practice in Stage 2 and is also addressed in lectures throughout the course.

Throughout the learner is encouraged to undertake independent reading both to supplement and consolidate what is being taught/learnt and to broaden their individual knowledge and understanding of the subject.

Assessment

Testing the knowledge base is through a combination of unseen written examinations (1-4, 9) and assessed coursework (1-9) in the form of laboratory experiment write-ups (1, 2, 4), essays (3, 5-7), examinations (8), coursework reports (3-9) and project reports and presentations (2, 3, 4, 7,8).

B Intellectual Abilities

Intellectual (thinking) skills able to:

1. Plan, conduct and report a programme of investigative work;
2. Analyse and solve engineering problems often using incomplete information (E);
3. Design a structure or component to meet a need (E);
4. Be creative in the solution of problems and in the development of designs (E);
5. Evaluate designs and make improvements (E);
6. Integrate and evaluate information and data from a variety of sources (E);
7. Take an holistic approach to solving problems and designing systems, applying professional judgements to balance risks, costs, benefits, safety, reliability, aesthetics and environmental impact (E);
8. Adopt an approach that depends less on standardised solutions and more on being able to identify, define and solve complex problems from first principles.

Teaching/learning methods and strategies

Intellectual skills are developed through the teaching and learning programme outlined above (and in section 11).

Analysis and problem solving skills are further developed through example, classes, tutorials, coursework and project work.

Experimental, research and design skills are further developed through coursework activities, laboratory experiments, and research and design projects. Individual feedback is given to students on all work produced.

Creative and design skills are developed through design and project work.

Assessment

Analysis and problem solving skills are assessed through unseen written examinations and

Experimental, research and design skills are assessed through laboratory experiment write-ups, coursework reports and project reports, presentations and unseen written examinations. Creative and design skills are assessed through coursework and unseen written examinations.

C. Practical skills

The skills to:

1. Execute safely a series of experiments (E);
2. Use laboratory equipment to generate data (E);
3. Analyse experimental or computational results and determine their strength and validity(E);
4. Prepare technical drawings;
5. Prepare technical reports;
6. Give technical presentations;
7. Search for and use the scientific literature effectively;
8. Take notes effectively;
9. Use computational tools and software (E);
10. Produce a conceptual or elemental design to a specification;
11 Develop and apply safe systems of work

Teaching/learning methods and strategies

Practical skills are developed through the teaching and learning programme outlined above (and in section 11).

Practical experimental skills (1-3) are developed through laboratory experiments and project work.

Skill 4 is taught through lectures and developed through drawing coursework exercises.

Skills 5 and 6 are taught through classes in Stage 1 and then developed through feedback on reports written and presentations made as part of coursework assignments.

Skill 7 is developed through research project work.

Skill 8 is taught in Stage 1 and practised throughout the programme.

Skill 9 is taught and developed through coursework exercises and project work.

Skill 10 is taught and developed through integrated design projects in Stages 1, 2 and 3 and lectures and coursework in Stages 2, 3 and 4.

Skill 11 is taught during laboratory work and field trips and through the application of safety assessments during final year projects

Assessment

Practical skills are assessed through laboratory experiment write-ups, coursework reports,

11. Programme structures: credits, modules, levels and awards.

The normal Undergraduate year is approximately 31 weeks, arranged in three terms and currently divided into two Semesters.

The course normally lasts four years, although it is possible to take a gap year or spend time abroad at an approved university.

Every Honours student studies 120 credits in each Stage (or year), resulting in M.Eng. 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.

All students follow the same programmes in Stages 1 and 2. In the third year, students elect to follow a specialisation within civil engineering. This is enhanced and extended in Stage 4. It is possible for a student to leave the programme after three years with a B.Eng. Honours degree by transferring to this programme at the end of Stage 2.

There is a Faculty Foundation Year for candidates not adequately qualified to embark on Stage 1 of Degree Programmes.

(Refs: Newcastle University Undergraduate Progress Regulations;
Degree Programme Handbook: http://www.ncl.ac.uk/ ?????)

Stage 1

Module code	Credit	Descriptive Title
CIV114	10	Integrated Design 1
CIV121	10	Engineering Properties of Materials
CIV122	10	Construction Materials
CIV136	20	Theory and Design of Structures A
CIV141	10	Transport Engineering
CIV154	10	Fluid Mechanics
SVY110	10	Information Technology 1
SVY113	20	Surveying
ENM105	20	Engineering Mathematics

The Integrated Design provides a central theme to Stage 1 and provides a first exposure to a wide range of learning outcomes, generally including elements of new knowledge (A4-A8), a broad range of intellectual activities (B1-B6), significant Professional and Transferable skills (C3-C6,C10; D1,D4-D6). A substantial mathematical base (A.1) is provided in ENM105, together with a range of modules providing core Civil Engineering knowledge (A2,A4,A8). The more analytical subjects also address intellectual abilities (B2,B4) and transferable skills (D2). Laboratory classes cover both practical (C1, C2, C3, C5) and transferable (D1-D6) skills.

Stage 2

Module code	Credit	Descriptive Title
CIV214	10	Integrated Design 2
CIV223	10	Engineering Geology
CIV224	15	Geotechnics
CIV230	20	Theory and Design of Structures B
CIV238	10	Construction Practice
CIV240	10	Design in Practice
CIV251	10	Hydraulics
CIV253	5	Hydraulic Design
SVY111	10	Information Technology 2
ENM205	10	Statistics and the Environment
ENM213	5	Numerical Methods
ENM922	5	Differential Equations and Series

Stage 2 continues the approach established in Stage 1, with design and its wide range of outcomes remaining central to the course. Mathematical knowledge is developed for higher level study in ENM205, 213 and 922. Technical modules extend both analytical and qualitative knowledge of Civil Engineering science (A2, A4, A7, A9,B2). Construction Practice also introduces areas of new knowledge (A3, A6, A9).

Stage 3

Module Code	Credit	Descriptive Title
CIV303	10	Engineering Ethics and Sustainability
CIV306	10	Elements of Economics and Business Finance
CIV325	15	Geotechnical Engineering
CIV332	10	Civil Engineering Practice
CIV351	10	Hydrology
CIV358	10	River and Coastal Engineering
CIV371	10	Advanced Structural Engineering
CIV373	5	Advanced Concrete and Masonry Design
CIV308	30	Multidisciplinary Design Project
And one of the following optional modules:		
CIV312	10	Wastewater Engineering
CIV324	10	Integrated Geotechnical Design
CIV375	10	Advanced Structural Design
CIV341	10	Design of Transport Infrastructure
CIV403	10	Advanced Hydraulics

Stage 3 contains a group design project, as befits the candidates' greater maturity and independence. The project addresses many learning outcomes including acquisition of new knowledge (A3-A9), intellectual abilities (B1-B7), practical skills (C3-C10) and transferable skills (D1-D7). Modules for a range of technical Civil Engineering studies develop understanding towards graduate level (A1,A2, A4, A7, A8, A9). There is also a strong management and business strand to the Stage: CIV303, CIV306, CIV332 relate to A3, A5, A6, A7 and to B7, in particular. Students choose the discipline in which they wish to specialise at the start of Stage 3.

Stage 4

Module Code	Credit	Descriptive Title
Compulsory:		
CIV418	10	Sustainable Environments
CIV431	10	Construction Management A
CIV432	10	Construction Management B
CIV400	30	Investigative Research Project
All Candidates shall take 20 credits from the following:		
1. A modern foreign language from those available in the School of Modern Languages, subject the approval of the Degree Programme Director		
2. CAD304 CAD301	10 10	Student Tutoring (Students into Schools Project) Advanced Student Tutoring (Students into Schools Project)
3. CIV491	20	The Construction Business
And modules to the value of 40 credits from the subject area followed at Stage 3:		
Environmental Engineering:		
CIV401	10	Environmental Engineering for Developing Countries
CIV402	10	Integrated Environmental Engineering Design
CIV404	10	Management of Hazardous Wastes, Industrial Wastewater and Contaminated Land
CIV406	10	Environmental Modelling
Geotechnical Engineering:		
CIV822	10	Soil Modelling and Numerical Methods
CIV823	10	Ground Engineering Techniques
CIV828	10	Rock Engineering
CIV971	10	Contaminated Land
Structural Engineering:		
CIV435	10	Structural Dynamics
CIV438	10	Specialist Structures
CIV481	10	Finite Element Theory for Structural Analysis
CIV482	10	Finite Element Analysis of Complex Problems in Structural Mechanics.
Transport Engineering:		
CIV942	10	Public Inquiry into a Transport Scheme
CIV943	10	The Economic and Financial Appraisal of Transport Actives
CIV944	10	Management and Operation of Public Transport Systems
CIV945	10	Intelligent Transport System and e-Services
Water Resources Engineering		
CIV405	10	Hydraulic Engineering Design
CIV710	10	Groundwater Assessment
CIV959	10	Hydrological Risks and Climate Change
CWI807	10	River Modelling

Stage 4 is designed to complete candidates' academic development as Chartered Engineers, which is endorsed by the JBM Accreditation of the programme. All students undertake an individual industrial project, which enables them to demonstrate their full and final achievement

of the learning outcomes for the course. Technical modules, which are predominantly quantitative, develop scientific knowledge to levels consistent with the students' future Professional careers. Students also take 20 credits of further 'broadening' modules. This gives the students the opportunity of either studying a foreign language, developing their enterprise skills or participate in the Students in Schools Project.

(Refs: Degree Programme Handbook: http://www.ncl.ac.uk/ ??????/ugrad/Deg-Prog-Hbk
Newcastle University U/Grad Prospectus 2001 p.146: http://www.ncl.ac.uk/undergraduate
http://www.ncl.ac.uk/civeng/uciv.html
http://www.ncl.ac.uk/ustruct2.html)

12. Support for Students

Services and facilities available to students include the following:

- Personal Tutor;
- Degree Programme Director;
- Stage Manager;
- Administrative staff and services;
- Coursework office;
- Student/staff ratio of 9.6:1
- Induction activities for each Stage;
- Study skills instruction in Stage 1 and University Web based materials;
- Library visits and instruction;
- Degree Programme Handbook (including Degree Regulations and Module sheets);
- School Handbook (Web based);
- University Computing Service facilities (including extensive PC and UNIX provision, software applications, e-mail and internet access);
- University (Robinson) Library, including search facilities and inter-library loans;
- Extensive laboratories;
- University Housing Office (which makes an offer of University accommodation to each first year student);
- University Careers Service;
- University Counselling Service;
- University Language Centre;
- Students' Union services, including societies, refectories and Student Advice Centre;
- Centre for Physical Recreation and Sport;
- Student Progress Office;
- International Office;
- University Chaplaincy;
- Saville Medical Practice.

(Ref: Degree Programme Handbook: http://www.ncl.ac.uk/????? /ugrad/Deg-Prog-Hbk
Undergraduate Prospectus 2001: http://www.ncl.ac.uk/undergraduate/
Newcastle University and You: http://www.ncl.ac.uk/services/welfare/nu.and.you/
University Student Handbook 1999;
Student Welfare Handbook http://www.ncl.ac.uk/services/welfare/whb /
University Student Handbook International Supplement 1999;
International Students' Handbook
Destination Newcastle 1999;
Student Accommodation 1999/2000 http://www.ncl.ac.uk/services/accom/
the Careers Service Guide 1999;
UCS: http://www.ncl.ac.uk/ucs/
The Language Centre http://www.ncl.ac.uk/langcen/
Newcastle University Library http://www.ncl.ac.uk/library
Tutor's Handbook: http://www.ncl.ac.uk/internal/thb)

13. Criteria for Admission

Admission offers normally conform to the UK Engineering Council "SARTOR" minimum requirements for M.Eng. with Chartered Engineer status (i.e. UK GCE A-level grades BBB (including Mathematics) for Stage 1 admission). In addition, the University recruits candidates with a wide range of equivalent qualifications based on its knowledge of SARTOR equivalents and other international qualifications. A limited number of international qualifications and HND holders with appropriate subjects and grades may be considered for direct entry to Stage 2. Exceptionally, suitably qualified candidates may be taken into Stage 3 of the 4-year M.Eng. programme.

Engineering requires a wide range of attributes and abilities, so selection is not solely based on academic grades. Selectors seek evidence of motivation and commitment from the Personal Statement and Reference on UCAS forms and applicants are encouraged to attend for interview whenever possible.

Notwithstanding adherence to SARTOR standards, the Department is committed to widening access, particularly for "late developers". Links exist with the Engineering Access Course at Newcastle College and there is a Faculty Foundation Year (Stage 0) for those with insufficient science and mathematics to enter Stage 1 directly. Limited numbers of places may be available to Regional candidates through the University's "Partners Programme". All UCAS forms, including Late or Summer applications are considered. The Department normally takes a limited number of candidates through Clearing.

Unlike many other Universities, the Department is committed to retaining its B.Eng. programme, both in recognition of the number of international students who wish to graduate after three years and to avoid exclusion of potentially good applicants who have not yet been able to demonstrate M.Eng. academic standards. The first two years of B.Eng. and M.Eng. are essentially common and any candidate passing Stage 2 "with Merit" may enter Stage 3 M.Eng.

14. Methods of evaluating and improving the quality and standards of teaching learning and assessment

Mechanisms for review

- Subject review
- Taught Programme Review)
- Module Review (including University Questionnaire Service returns)
- Stage Review Meetings (including Stage questionnaires for each Semester)
- Annual Revision of Regulations
- Annual Revision of Module Sheets
- Accreditation Reports
- HEFCE/QAA Reports
- External Examiners' Reports to VC

Committees with responsibilities for quality and standards

- University Teaching Committee
- Faculty Teaching Committee
- Faculty Policy & Resources Committee (for resource issues)
- Board of Studies
- Departmental Teaching Committee
- Departmental Policy & Resources Committee (for resource issues)
- Departmental Staff/Student Committee
- Board of Examiners

Mechanisms for student feedback

- University Questionnaire Service returns
- Stage Questionnaires
- Student representation on Board of Studies
- University Staff/Student Committee
- Student representation on University Teaching Committee
- Weekly small group tutorial (Stage 1)
- Personal Tutors

Staff Development activities

- All new staff complete the Certificate in Teaching & Learning
- Seminars arranged by University Quality Standards Unit for all Departmental staff in 1999/2000
- Biennial Appraisal linked to staff development
- Annual Board of Studies review of module delivery

(The following internal documentation is maintained:

: Preparing for Subject Review
: Guidelines for Taught Programme Review 1999
: Module Boxes, Departmental Records room
: Stage Review file, Departmental Records room
: DTC minutes, Departmental Records room
: Degree Programme Handbook: http://www.ncl.ac.uk/???? /ugrad/Deg-Prog-Hbk
: I.Mech.E. Accreditation report, 21st May, 1996
: HEFCE Quality Assessment Report Q22/93, May, 1993: http://www.niss.ac.uk/education/hefce/qar/q22-93.html
: FTC Minutes
: FP&RC confidential Minutes, maintained by Faculty Asst. Registrar
: BoS. Minutes file, Departmental Records Room)
: Staff/Student Minutes file, Departmental Records Room
: Exam. Board Minutes file, Departmental Records Room

the nature of this documentation is such that most is not in the public domain.)

15. Regulation of Standards

Assessment rules

- The Assessment rules are given in the "Undergraduate Examination Conventions".
- The minimum pass mark is normally 40%.
- There is limited compensation for marks of 35-40% at all but the final Stage.
- Candidates for all but the final Stage may normally repeat assessments on up to three occasions.
- All Honours candidates must complete one Stage before proceeding to the next.

Honours Classification

- Stage 2 and subsequent Stages contribute to the Honours classification. For most M.Eng. candidates, the weighting is 25:35:40 for Stages 2:3:4.
- The rules for the award of Honours are given in the "Undergraduate Examination Conventions"
- The Faculty awards degrees by *The Averaging Method* as specified in the Undergraduate Examination Conventions. Subject to the other provisions of those Conventions, the link between marks and classification is as given below:

Mark	**Class of Honours**
<40	Fail
40-49	Third Class
50-59	Second Class, Second Division
60-69	Second Class, First Division
70+	First Class

Role of the External Examiner

The External Examiners are involved in assessment at all Stages. Duties will normally include:

- Approval of Examination Papers
- Vetting in-course assessments and examination scripts
- Interviewing a selection of candidates prior to the June Examination Board
- Attending the June Board and participating in its deliberations
- Reviewing any subsequent special cases, either by correspondence or in special circumstances by subsequent visits to Newcastle.
- Returning a confidential report to the VC.

(Refs: University Regulations: Undergraduate Progress Regulations and Degree Programme Conventions
Degree Programme Handbook: http://www.ncl.ac.uk/???? /ugrad/Deg-Prog-Hbk
Handbook for External Examiners of Undergraduate Examinations)

16. Indicators of Quality and Standards

- Annual External Examiners' Reports (Departmental and FTC reviews)
- Accreditation Reports
- Annual review of student destinations
- Annual Module and Stage Review process reported to Board of Studies
- Staff / Student Committee Minutes reviewed by Board of Studies
- Annual FTC review of Faculty intake (by Department) against SARTOR standards
- Annual FTC review of Faculty Stage 1 progression (by Department)
- Annual FTC review of student feedback questionnaires recently initiated to be fully operative from 2000/2001
- Biennial UTC "Taught Programme Review"
- Quinquennial UTC "Subject Review"

(Ref: : Preparing for Subject Review
: Guidelines for Taught Programme Review 1999
: FTC Minutes
: FP&RC confidential Minutes, maintained by Faculty Asst. Registrar
: BoS. Minutes file, Departmental Records Room
: University Careers Service reports: http://www.careers.ncl.ac.uk/academics
: Staff/Student Minutes file, Departmental Records Room
: Exam. Board Minutes file, Departmental Records Room)

Warning

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 if they take advantage of the opportunities provided. More detailed information on the specific learning outcomes, indicative content and teaching, learning and assessment can be found in the Degree Programme Handbook and other University documentation.

The information from this document may be selectively extracted and included in documents that are more appropriate for non-academic audiences, for example, students, intending students and employers.