UNIVERSITY
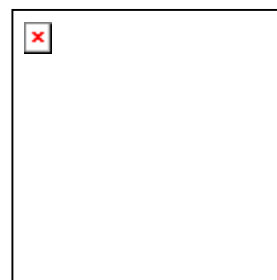## OF
NEWCASTLE UPON TYNE

DEGREE PROGRAMME SPECIFICATION

1. Awarding Institution: University of Newcastle upon Tyne

2. Teaching Institution: University of Newcastle upon Tyne

3. Programmes Accredited by: N/A

4. Final Award: M.Sc.

5. Programme Titles: M.Sc. in Sustainable Management of the Water Environment (5040)

6. UCAS codes: N/A

7. QAA Benchmarking Group   N/A

8. Date of production / revision   November 2004 (revision)

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9. Educational Aims of the Programme

The programme aims:

- to provide opportunities for candidates with first degrees in a range of scientific and engineering disciplines to enhance their knowledge of the water environment and its management, through theoretical, practical and computational (informatics) training;
- to provide a quantitative training very relevant to the needs of the water industry;
- to offer experience in the planning and execution of an extended research project;
- to provide experience of dissertation writing and other presentational skills;
- to meet the requirements of the Institution of Civil Engineers (accreditation to be sought);
- to provide a qualification which meets the designated learning outcomes at level 4 of the National Qualifications Framework.

10. Programme Outcomes

The programmes provide opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas. The typical (modal) student will have:

A. Knowledge & Understanding

A.1.   A sound scientific understanding in key subject areas such as hydrology, hydraulics, water quality, data collection, computational techniques and information systems.

A.2.   An advanced knowledge and understanding of selected components of the natural water environment and water infrastructure, and their management.

A.3.   Where appropriate, mathematical methods, computational modelling and hydroinformatic techniques, ensuring a quantitative training.

A.4.   An understanding of the meaning of "sustainability" in the context of environmental water management.

A.5.   Specific examples of water management schemes.

Teaching/learning methods and strategies:

Acquisition of A.1 and A.2 is through a combination of lectures, tutorials, example classes, laboratory activities and coursework.
Outcome A.3 is achieved by lectures, tutorials and, where appropriate, hands-on computer exercises.
Acquisition of A.4 and A.5 is partly by lecture and tutorial and partly by a case study and field visits.

Assessment

Formal assessment occurs through tutorial examples and coursework. The primary means of assessing factual knowledge is the closed book examination. This is supported by assessed written coursework.
In-depth individual learning frequently forms part of the project, which is assessed by dissertation, poster, oral presentation and viva voce examination.

B. Intellectual Abilities

B.1.   Ability to select and apply appropriate mathematical methods for modelling and analysing relevant problems;

B.2.   Use of scientific principles in the development of engineering and environmental solutions to practical problems in the water environment and water infrastructure operation;

B.3.   Use of scientific principles in the modelling and analysis of the water environment and of water infrastructure operation;

B.4.   Ability to select and apply appropriate computer based methods for modelling and analyzing problems in the water environment and in water infrastructure operation;

B.5   Creation of new products or methodologies or research outputs through synthesis of ideas from a wide range of sources;

B.6.   Ability to produce solutions to problems through the application of engineering and water environment knowledge and understanding.

Teaching/learning methods and strategies:

Where appropriate, B.1. is reinforced in lectures, but learning is principally in tutorials and assignments.
Outcomes B.2 – B.4. are initially encountered in lectures, practical classes and coursework but are developed principally during the research project.
Acquisition of B.5. occurs through lectures and may form a major part of the project.
B.6. is introduced in lectures and developed through tutorials, coursework and the project.

Assessment

Closed-book examinations are used to assess intellectual abilities.
Assessed coursework provides further opportunities to demonstrate intellect and ability.
The project, which is assessed by dissertation, poster, oral presentation and viva voce examination, provides final evidence of the levels attained.

C. Practical Skills

C.1.   Use of relevant field and laboratory measurement equipment;
C.2.   Experimental field and laboratory work;
C.3.   Planning, execution and reporting of a research project;
C.4.   The ability to use IT tools and hydroinformatics technologies;
C.5.   Ability to design components of the water infrastructure and schemes for management of the water environment;
C.6.   Practical testing of design ideas through computer simulation with technical analysis and critical evaluation of results;
C.7.   Ability to search for information and develop ideas further;
C.8.   Ability to apply engineering and environmental techniques taking account of industrial, legislative and commercial constraints;

Teaching/learning methods and strategies:

Outcomes C.1-C.3. are acquired principally through experience of the project.
Acquisition of C.4. is initially through lectures, developed through hands-on exercises and assignments. Further individual learning may also form a significant part of the project.
C.5. is introduced through lectures and developed through coursework. It will frequently form a central part of the project.
Coursework provides initial experience of C.6. and C.7. but the project forms the principal vehicle for their acquisition.
Outcome C.8. is introduced through lectures. Some projects may require further individual learning in this area.

Assessment

Outcomes C.1-C.8 are not explicitly assessed, but are necessary for the successful completion of coursework and project requirements.

D. General Transferable Skills

D.1.   Manipulation and presentation of data in a variety of ways;
D.2.   Use of scientific evidence based methods in the solution of problems;
D.3.   Use of creativity and innovation in problem solving;
D.4.   Effective communication (including written, oral and poster media);
D.5.   Learn independently in a range of situations, preparing for life long learning;
D.6.   Use of general IT skills;
D.7.   Time and resource management;

Teaching/learning methods and strategies:

Outcomes D.1-D.7. may be introduced through examples in lectures.   D.1-D.5 are developed further through coursework. Subsequently, the principal development of transferable skills occurs through involvement in the project.

Assessment

Skills D.1-D.3 are essential to complete examination and assignments to a satisfactory standard.
Acquisition of D.4. and D.5. is demonstrated during the assessment of both coursework and the project.
Outcomes D.6 and D.7. are essential for satisfactory completion of the dissertation and project, which also requires command of outcomes D.1-D.5.

The above Learning Outcomes have been compared with the QAA Frameworks for Higher Education Qualifications Descriptor for a qualification at Masters (M) level. They are believed to meet or exceed the requirements of that Descriptor.

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

The normal undergraduate year, extending from the middle of September to the middle of June, is approximately 31 weeks, arranged in three terms and currently divided into two Semesters. In contrast, the M.Sc. year occupies nearly the full 12 month period, with the summer period (June-September) essentially constituting an additional semester.

Every M.Sc. student studies 180 credits over the academic year. The academic courses, comprising 100 credits, are taught in Semesters 1 and 2, and the 80 credits associated with the project are notionally allocated to part of the second semester and the summer period.

The programme of study is as defined below:

Module code	Credit	Descriptive Title
Compulsory modules:		
CIV702	10	Research Methods
CIV868	10	Integrated River Basin Management
CIV937	10	Computation and Hydroinformatics
CIV938	10	Data and Hydroinformatics
CIV954	5	Introduction to Informatics
CIV956	10	Sustainability and Water Resources including Case Study
CIV967	15	Water Quantity and Quality
CIV998	80	Dissertation
And modules to the value of 30 credits from the following:		
CIV703	10	Groundwater Modelling
CIV710	10	Groundwater Assessment
CIV817	10	Urban Drainage Systems
CIV865	10	Catchment Modelling
CIV904	10	Environmental Risk Management
CIV908	10	Environmental Engineering and Water Resources for Developing Countries
CIV912	10	Wastewater Engineering
CIV955	10	Hydroinformatic Systems Development
CIV958	10	Hydroecology
CIV959	10	Hydrological Risks and Climate Change

During the first two semesters, the primary aims of enhancing knowledge of the water environment and water infrastructure (Outcomes A.1, A.2, A.4, A.5) are met through a range of appropriate technical modules. These include compulsory as well as optional modules with a strong IT (hydroinformatic) content. Those students requiring development of mathematical skills (A.3, B.1) may take a remedial mathematics course at the start of the first semester.

Intellectual abilities (B.1-B.6) are introduced initially in the lectured modules, but are further developed through coursework. Coursework also develops Practical Skills (C.7, C.8) and a range of Transferable Skills (D.1-D.6).

The Project, which forms a substantial part of the programme, may involve individual acquisition of knowledge and abilities (A.1-A.5, B.1-B.6).

Project planning and execution (C.3) is practised throughout the summer period. Experience is also gained of the Practical Skills (C.1-C.8). Satisfactory completion of the dissertation and examination requires strong command of the Transferable Skills (D.1-D.7).

12. Support for Students

Services and facilities available to students include the following:

- Personal Tutor;
- Degree Programme Director;
- Administrative staff and services;
- Student/Staff ratio of about 2:1;
- Library visits and instruction;
- School Student Handbook (Web based);
- Water Resources Group Postgraduate Degree Programme Handbook;
- University Information Systems and Services (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 Accommodation Office;
- University Careers Service;
- University Counselling Service;
- University Language Centre;
- University Disability Support;
- 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: Postgraduate Student Support: http://www.ncl.ac.uk/student-support/postgraduate
    Student Welfare   http://www.ncl.ac.uk/student-support/welfare.htm
    Student Progress Office: http://www.ncl.ac.uk/spo/
    Student Accommodation: http://www.ncl.ac.uk/accommodation
    Careers Service: http://crilly.ncl.ac.uk/cems/careers/students/pages/login.asp
    University Computing Service   http://www.ncl.ac.uk/iss/
    The Language Centre   http://www.ncl.ac.uk/langcen/
    Newcastle University Library   http://www.ncl.ac.uk/library
    Disability Support   http://www.ncl.ac.uk/disability.services/
    Tutor's Handbook: http://www.ncl.ac.uk/internal/documents/tutorshandbook.pdf

13. Criteria for Admission

Students wishing to be accepted on to the M.Sc. course should have a good (2ii Honours or better) first (Bachelor) degree in a relevant science or engineering subject (or the equivalent qualification from outside the UK). Proficiency in mathematics (UK Advanced level or its equivalent) and English is also normally required.

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

Mechanisms for review

- Subject review
- Module Review (including University Questionnaire Service returns)
- Annual Revision of Regulations
- Annual Revision of Module Outline Forms
- Annual Monitoring and Review report by Board of Studies
- Accreditation Reports
- HEFCE/QAA Reports
- External Examiners' Reports to VC

Committees with responsibilities for quality and standards

- University Teaching and Learning Committee (UTLC)
- Faculty Teaching and Learning Committee (FTLC)
- Faculty Executive Board (for resource issues)
- Board of Studies
- School Teaching and Learning Committee (STLC)
- School Planning & Resources Committee (for resource issues)
- School Postgraduate Staff/Student Committee
- Board of Examiners

Mechanisms for student feedback

- University Questionnaire Service returns
- School Postgraduate Staff/Student Committee
- Student representation on Board of Studies
- University Staff/Student Committee
- Student representation on University Teaching Committee
- Personal Tutors
- Annual Board of Studies review of module delivery

Staff Development activities

- All new staff complete Certificate in Teaching & Learning
- Seminars arranged by University Quality Standards Unit for all School staff
- Biennial Appraisal linked to staff development (Performance Development Review)

(Refs: University Internal Subject Review programme   http://www.ncl.ac.uk/internal/aqss/redirect.php

Guidelines for Annual Monitoring and Review http://www.ncl.ac.uk/internal/aqss/qsh/annual_monitoring_and_review/

Module Ouline Forms

STLC minutes

FTLC minutes

Faculty Executive Board minutes

Degree Programme Handbook: http://www.ncl.ac.uk/internal/aqss/dpd/

Board of Studies Minutes file, School Office

Postgraduate Staff/Student Minutes file, School Office

Board of Examiners Minutes file, School Office

(The nature of these records is such that many are not in the public domain.)

15. Regulation of Standards

Assessment rules

- The Assessment rules are given in the "PGT Progress Regulations (IV. Taught Postgraduate Masters' Degree Entrance and Progress Regulations)" and the "PGT Exam Conventions".
- The minimum pass mark is normally 50%.
  50-59   Pass
  60-69   Pass with Merit
  70+   Pass with Distinction
- For certain defined conditions an award by compensation may be made even if some module marks are less than 50%.

Role of the External Examiner

The External Examiner is involved in assessment of the course.   Duties will normally include:

- Approval of Examination Papers
- Vetting in-course assessments and examination scripts
- Interviewing candidates prior to the Final Examination Board
- Attending the Final 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.

16. Indicators of Quality and Standards

- Annual External Examiners' Reports (School and Faculty TLC reviews)
- Annual review of student destinations
- Annual FTLC review of Board of Studies Annual Monitoring and Review report
- Annual Module and Stage Review process reported to Board of Studies
- Postgraduate Staff / Student Committee Minutes reviewed by Board of Studies
- Annual FTLC review of student feedback questionnaires
- Quinquennial UTLC "Subject Review"

(Ref: University Careers Service reports)

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.

It should be noted that there may be variations in the range of learning opportunities reflecting the availability of staff to teach them.   While every effort will be made to ensure that the module or modules described in the programme specification are available, this cannot be guaranteed.

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.