PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	MSc/PG Dip
4	**Programme Title**	Flood Risk Management (Flexible)
5	**Programme Code**	5130P/3406P
6	**Programme Accreditation**	
7	**QAA Subject Benchmark(s)**	Engineering
8	**FHEQ Level**	7
9	**Last updated**	April 2011

10 Programme Aims

1 To provide opportunity for students from a range of disciplines to enhance their knowledge of the water environment and flood risk management through a programme of flexible learning involving theoretical, practical and computational (informatics) components

2 To satisfy the professional development needs of individuals and their employers and build a new cadre of Flood Risk Management professionals to lead and develop the subject in their own countries and institutions: graduates from the programme should be able to meet the accreditation requirements for chartered status in ICE and CIWEM;.

3 To develop understanding of the physical causes, mechanisms and consequences of floods;

4 To develop the theoretical knowledge and practical skills in computing and informatics needed to forecast and manage floods;

5 To develop understanding and put into practice the principles of policy, planning and guidance for risk management of floods in a social and economic context;

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:

A.1. A sound scientific understanding of key technical subject areas required for flood risk management, including hydrology, hydraulics, data collection, computational techniques and information systems.

A.2. An advanced knowledge and detailed understanding of selected aspects of flood hydrology and meteorology, river modelling, flood forecasting and warning and risk assessment.

A.3. Where appropriate, a working knowledge of mathematical methods, computational modelling and hydroinformatic techniques to allow the specification and understanding of appropriate technologies for flood risk management and to ensure a quantitative training.

A.4. A sound understanding of key socio-economic issues required for flood risk management covering relevant aspects of policy, planning and institutional responsibilities.

A.5. Familiarity with representative examples of flood defence and warning schemes, and national institutional arrangements.

Teaching and Learning Methods

Acquisition of A.1 to A.3 is through a combination of flexible learning, intensive one week residential courses (comprising both lectures and tutorials) at Newcastle, coursework and directed reading.

The residential courses generally operate with lectures/theory in the morning sessions and practical (usually computer based sessions) in pm to reinforce understanding.

Flexible learning is based on high quality course materials provided on CD for self-learning with 1 or 2 day residential periods. Self assessment questions are provided and discussion forums via the Internet provide opportunity for support by fellow students and staff moderators.

Directed reading is given by either lists of papers/books and suggested sources, or by direct provision of key references as pdf.

Acquisition of A.4 and A.5 is partly by the above techniques and partly by field visits.

Assessment Strategy

Assessment occurs through combinations of coursework and examination. The primary means of assessing factual knowledge is the closed book examination. This is supported by assessed written coursework. In-depth individual learning is essential for the completion of the project, which is assessed by dissertation, poster, oral presentation and viva voce examination.

Intellectual Skills

On completing the programme students should be able to:

B.1 Select and apply appropriate mathematical and computer based methods for modelling and analysing flood risk estimation, management or forecasting problems;

B.2 Use scientific principles in the development of engineering and environmental solutions to practical problems in flood risk management;

B.3 Use scientific principles in the modelling and analysis of flood risk management;

B.4 Select and apply appropriate computer-based methods for modelling and analyzing problems in flood risk management;

B.5 Produce solutions to problems through the application of engineering and water environment knowledge and understanding.

B.6 Select and apply appropriate socio-economic analysis methods for appraising and selecting flood defence options;

Teaching and Learning Methods

Teaching is firstly through a mix of flexible learning and residential 1 week courses as described previously. The most important learning mechanism is then with the progression from guided practical work using class examples, into independent coursework using data sets, methods and software which have been introduced in the practicals.

Assessment Strategy

Assessed coursework and the dissertation provide the main opportunity to demonstrate intellect and ability. The project is assessed by dissertation, poster, oral presentation and viva voce examination, and provides final evidence of the levels attained.

Closed-book examinations are also used to assess intellectual abilities, where more extended questions are provided to demonstrate deeper understanding and ability to outline more

developed solutions.

Practical Skills

On completing the programme students should be able to:
C.1 Plan, execute and report a research or consultancy project;

C.2 Use IT tools and hydroinformatics technologies, including familiarity with key planning and design tools of flood risk management including Flood Estimation Handbook, river models and flood forecasting systems;

C.3 Plan, appraise and design components of flood defence and warning infrastructure and schemes for management of flood risk;

C.4 Test design ideas through computer simulation with technical analysis and critical evaluation of results;

C.5 Apply engineering and environmental techniques taking account of legislative, social and commercial constraints.

Teaching and Learning Methods

Learning is through the practical sessions on resident weeks and also in flexible learning modules which have extended coursework tasks using real data and industry standard software.

The investigative project provides the major opportunity to practice and develop skills in a real world setting, usually working on a topic agreed between the student's employer and academic staff.

Assessment Strategy

Outcomes C.1–C.5 are assessed through the successful completion of coursework and project requirements.
For C.3, an individual exercise in Flood Forecasting is carried out during the block week and assessed competitively (but marks not carried forward) to engage students more actively.

Transferable/Key Skills

On completing the programme students should be able to:
D.1 Manipulate and present data in a variety of ways;

D.2 Use methods based on scientific evidence in the solution of problems;

D.3 Use creativity and innovation in problem solving;

D.4 Effectively communicate (including written, oral and poster media);

D.5 Use general IT skills (document authoring and publication, spreadsheet analysis);

D.6 Practice time and resource management;

Teaching and Learning Methods

Outcomes D.1–D.6 are introduced through examples in coursework in various modules. D1 is especially focussed in the CIV8502 module on Quantitative Methods for Engineers.

Major development of transferable skills occurs through involvement in the project, especially D.6.

Assessment Strategy

Skills D.1–D.3 are essential to complete examinations and assignments to a satisfactory

standard.
Acquisition of D.4 is demonstrated during assessment of coursework and of the project. Outcomes D.5 and D.6 are essential for satisfactory completion of the coursework and the project. Completion of the project also requires command of outcomes D.1–D.4.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

The programme is designed to provide training at MSc and Diploma level for recent graduates in full-time employment in industry. The degree takes a minimum of three years and a maximum of six years to complete. Every MSc student studies 180 credits. The completion of the compulsory modules and tutorial assignments, comprising 90 credits, will normally take place in Years 1 and 2. Optional modules, comprising 10 credits, will normally be taken over the three-year period. A work-based dissertation, comprising 80 credits, will normally be undertaken during Years 2 and 3. All students are required to discuss their pattern of study with their academic tutor to ensure that they are following an appropriate programme.
All students are appointed an academic supervisor and an industrial supervisor to advise on the work-based dissertation and any issues that may arise during the programme.

The programme of study is as defined below.

Module code	Descriptive Title	Credits	MSc	Dip.	Mode of Study
CEG8502	Quantitative Methods for Engineering	10	Comp	Comp	DL
CEG8504	Hydrosystems: Processes and Management	20	Comp	Comp	DL
CEG8505	Climate Change: Earth System, Future Scenarios and Threats	10	Comp	-	Block
CEG8506	Hydrosystems Modelling	10	Comp	Comp	Block
CEG8509	Options for Flood Risk Management	10	Comp	Comp	DL
CEG8510	Flood Management: Governance, Planning and Project Appraisal	10	Comp	Comp	DL
CEG8512	Integrated River Basin Management	10	Opt	-	Block
CEG8514	Climate Change: Vulnerability, Impacts and Adaptation	10	Opt	-	Block
CEG8515	Modelling of Floods	10	Comp	Comp	Block
CEG8518	Real time flood forecasting and warning systems	10	Comp	Comp	Block
CEG8598	MSc Project and Dissertation in Water Resources	80	Comp	-	-
CEG8597	Diploma Project and Dissertation in Water Resources	40	-	Comp	-

Linear = taught course with lectures and tutorials given each week over an extended period

Block = a residential course taken full-time during a week at Newcastle, sometimes with subsequent coursework.

(DL = Distance Learning)

Comp. = compulsory; Opt = optional; (the usual route through the course is CEG8514; however, this module may be substituted for by CEG8512 – MSc route only)

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

The MSc in Flood Risk Management provides a flexible programme for graduates either already working in the flood sector or planning to move into it.

It is distinctive in that it combines technical aspects such as hydrology, hydraulics and informatics with socio-economic contexts to fully equip practitioners and project managers.

It makes use of the internationally leading research of the Water Resources Group in hydrology, hydraulics and climate change, ensuring that students are taught by internationally respected staff.

It is unusual in engineering terms in that it recognizes the emergence of climate change as a central challenge and context for flood risk management;

Programme regulations (link to on-line version)

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

13 Criteria for admission

Entry qualifications

A second-class Honours degree in a relevant science or engineering subject or an international equivalent. Proficiency in mathematics (UK A level or its equivalent) is normally required. Candidates who do not have A level (or equivalent) in mathematics will have their mathematical knowledge assessed prior to acceptance. Other equivalent qualifications and/or relevant industrial experience will be considered for entry.

Admissions policy/selection tools

Non-standard Entry Requirements

Additional Requirements

Level of English Language capability

Applicants whose first language is not English require IELTS 6.5, TOEFL 90 (Internet-based) or 577 (paper-based), 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 University 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 University 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 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

This degree programme is accredited as meeting the requirements for Further Learning for a Chartered Engineer (CEng) for candidates who have already acquired an Accredited CEng (Partial) BEng (Hons) or an Accredited IEng (Full) BEng/BSc (Hons) undergraduate first degree, for intakes up to 2011. See http://www.jbm.org.uk/ for further information.

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 from the internal website)

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**
CEG8502	Compulsory	1,3			1,2,5
CEG8504	Compulsory	1,2	3,	4,5	5
CEG8505	Compulsory	2	3,	4,5	4,5
CEG8506	Compulsory	2,3	1,2	2,4	5
CEG8509	Compulsory	4,5	1,2,4,6	5	2,5
CEG8510	Compulsory	4,5	6	5	4,5
CEG8512	Optional	1,4,5	2,3,6	5	4,5
CEG8514	Optional	2,4	2,3,6	4,5	3,4,5
CEG8515	Compulsory	2,3,5	1,2,3	2,3,4	5
CEG8518	Compulsory	2,3,5	1,2,3,4	2,3,4	1,2,3,4,5
CEG8598	Compulsory	2,3,4,5	1,2,5	1,2	4,5, 6