PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	MSc
4	**Programme Title**	MSc in Hydrology and Water Management Master of Science in Water Management (exit award)
5	**Programme Code**	5408F/P 5470F (exit award)
6	**Programme Accreditation**	JBM, CIWEM, RICS
7	**QAA Subject Benchmark(s)**	Engineering
8	**FHEQ Level**	Level 7
9	**Last updated**	May 2023

10 Programme Aims

1) To provide opportunities for candidates with first degrees in a range of scientific and engineering disciplines to enhance their knowledge of the nature, occurrence, characterisation and management of water, including specialisms in climate change, hydroinformatics, or flood risk management;

2) To provide a theoretical and practical quantitative training very relevant to the needs of the water and environmental engineering industries;

3) To offer experience in the planning and execution of an extended research project. To provide experience of dissertation writing and other presentation and generic skills relevant to employer's needs;

4) To satisfy the professional development needs of the individual and of their employers;

5) To provide a programme which meets the QAA Frameworks for Higher Education Qualifications descriptor for Masters degrees (7).

6) To provide a programme that meets the accreditation requirements of the Joint Board of Moderators (JBM www.jbm.org.uk) 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.

7) To provide an entry route into an appropriate professional institution such as the Chartered Institution of Water and Environmental Management (CIWEM www.ciwem.org.uk), and the Royal Institution of Chartered Surveyors (RICS www.rics.org/uk).

8) To provide a programme designed to meets the standards set by the Engineering Council's Accreditation of Higher Education Programmes (AHEP3, May 2014).
http://www.engc.org.uk/engcdocuments/internet/Website/Accreditation%20of%20Higher%20Education%20Programmes%20third%20edition%20(1).pdf

9) To provide a programme that develops the skills, attributes and values defined in the University's Graduate Skills Framework.
http://www.ncl.ac.uk/quilt/modules/gsf.htm

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:

A1 A sound scientific understanding in key subject areas such as hydrology and hydraulics;

A2 An advanced knowledge and understanding of selected components dependent on the specialism chosen;

A3 An understanding of the theoretical basis for methods of analysis and modelling.

A4 An understanding of the regulatory and socio-economic aspects of water management;

A5 Knowledge of specific examples of water management, drawing on experiences from developing countries and industrialised countries.

Teaching and Learning Methods

For the full-time programme, essential material is taught through lecture classes and online materials in Semester 1, supported by a combination of tutorials, practical classes, coursework and site visits. The basic concepts and understanding are further developed in specialist modules in Semester 2, helping to develop deeper understanding and the wider contexts of the subject. Coursework exercises and exams provide the opportunity for reflection and consolidation of learning. The dissertation project provides the opportunity to develop the depth of understanding further in one particular field.

The part-time programmes use the same teaching and learning methods and programme structure, except that the dissertation is taken as a Distance Learning module, with supervisory support through email and video contact as well as face-to-face meetings.

Assessment Strategy

Formative assessment occurs through tutorial examples and coursework. The primary means of assessing knowledge and understanding is assessed coursework. This is supported by examinations.

In-depth individual learning frequently forms part of the project, which is assessed by dissertation report, and summary article

Intellectual Skills

On completing the programme students should be able to:

B1 Plan, execute and report on a significant piece of research related to a deeper analytical understanding of a problem or application which is evaluated according to explicit and measurable criteria;

B2 Select and apply appropriate mathematical methods for modelling and analysing relevant problems;

B3 Use scientific principles in the development of mathematical and environmental solutions to practical problems in water management;

B4 Select and apply appropriate mathematical methods for modelling and analysing problems in water management;

B5 Create new products or methodologies or research outputs through synthesis of ideas from a wide range of sources;

B6 Produce solutions to problems through the application of mathematical and water environment knowledge and understanding.

Teaching and Learning Methods

Intellectual skills are developed initially through tutorials in which underpinning knowledge and understanding is translated into the ability to select and apply appropriate analysis tools. This is further developed through coursework, where the student applies analysis tools to real-world problems and data sets. Field visits help further to relate learning to real-world environments and problems. Learning is consolidated through development of individual research, including ability to identify problems and provide resolutions to these problems. Development of the key skills required to enable the individual research is through tutorial exercises focussed on specific skills in planning, research, and critical analysis.

Assessment Strategy

Closed-book examinations are used to assess intellectual abilities.

Assessed coursework provides further opportunities to demonstrate intellect and ability.

The project is assessed by dissertation report, summary article, and portfolio, and provides final evidence of the levels attained.

All skills are necessary to complete coursework and project requirements successfully.

Practical Skills

On completing the programme students should be able to:

C1 Use relevant analytical and measurement equipment;

C2 Competently carry out experimental laboratory work;

C3 Plan, execute and report on a research project;

C4 Use IT tools and hydroinformatics technologies;

C5 Design water infrastructure and schemes for water management;

C6 Carry out practical testing of design ideas through computer simulation with technical analysis and critical evaluation of results;

C7 Search for information and develop ideas further;

C8 Select and apply appropriate engineering design and environmental techniques taking account of industrial, legislative and commercial constraints.

Teaching and Learning Methods

Learning is developed through teaching of basic skills including hydroinformatic and modelling skills and field exercises. Basic design principles are taught and practised as workshop practical exercises. These basic skills are practised in case study applications and in the dissertation project, where students are expected and encouraged to develop their own experimental approaches to test ideas, and to apply appropriate techniques and evaluate the results.

Assessment Strategy

Outcomes C1–C8 are not explicitly assessed but are necessary for the successful completion of coursework and project requirements.

Transferable/Key Skills

On completing the programme students should be able to:

D1 Retrieve information from literature/databases and manipulate and present data in a variety of ways;

D2 Use scientific evidence-based methods in the solution of problems;

D3 Be creative and innovative in problem solving;

D4 Effectively communicate with specialist and non-specialist audiences;

D5 Learn independently in a range of situations, preparing for lifelong learning;

D6 Efficiently use general IT skills;

D7 Manage time and resources, plan laboratory-based programmes, assess hazards and risks and work safely.

Teaching and Learning Methods

Outcomes D1-D7 may be introduced through examples in lectures and tutorials. D1-D5 are developed further through coursework. Extensive use of practical examples enables the building of key skills.

Subsequently, the principal development of transferable skills occurs through involvement in the project, for which specific skills in data manipulation, communication, resources planning, etc. are taught, and all skills are necessary to complete the dissertation.

Assessment Strategy

Skills D1–D3 are essential to complete examinations and assignments to a satisfactory standard.

Acquisition of D4 and D5 is demonstrated during assessment of coursework and of the project.

Outcomes D6 and D7 are essential for satisfactory completion of the coursework and the project. Completion of the project also requires command of outcomes D1–D5. The assessment of the dissertation covers integration of all key and transferable skills, providing an overall assessment of a student's skills which are of key relevance to employers.

The above Learning Outcomes have been compared with the QAA Frameworks for Higher Education Qualifications Descriptor for a qualification at Masters (7) level. They are believed to meet or exceed the requirements of that Descriptor.

12 Programme Curriculum, Structure and Features

Basic Structure of the Programme

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 MSc year occupies nearly the full 12-month period, with the summer period (June-August) essentially constituting an additional semester.

Every MSc student studies 180 credits over the academic year. The academic courses, comprising 120 credits, are taught in Semesters 1 and 2, and the 60 credits associated with the project are notionally allocated to part of the second semester and the third semester. Part time students take taught modules over semesters 1 and 2 during the years of their study while the dissertation is usually spread over the whole last year of their study.

During the first two semesters, the primary aims of enhancing knowledge of the water environment and water infrastructure (A1, A2, A4, A5) are met through a range of appropriate technical modules. These include compulsory as well as optional modules with a strong IT (hydroinformatic) content. A common minimum level of mathematical skills (A3, B2) is ensured through the compulsory module in Quantitative Methods for Engineering, taken at the start of the course.

Intellectual skills (B2–B6) are developed initially in the lectured modules but are further reinforced through coursework. Coursework also develops practical skills (C7, C8) and a range of transferable skills (D1–D7).

The project, which forms a substantial part of the programme, may involve individual acquisition of knowledge and abilities (A1–A5, B1–B6).

Project planning and execution (B1, C3) is practised throughout the summer period. Experience is also gained of practical skills (C1–C8). Satisfactory completion of the dissertation and examinations requires strong command of transferable skills (D1–D7).

Key Features of the Programme (including what makes the programme distinctive)

The Hydrology and Water Management programme is one of only a few of its type in the UK that offers a rigorous quantitative engineering approach to broad aspects of water management offering both full-time and part-time programmes. The course curriculum is distinctive in that it offers a broad-based approach to hydrology, including aspects of socio-economic understanding, catchment science, etc, in addition to the more traditional engineering aspects of the subject. It has a solid foundation on the development of numerical and problem-solving skills which is attractive to industry.

It provides understanding of a context of sustainable water resource management and recognizes through its specialisms the emergence of climate change as a central challenge and context for the water sector, the importance of flood risk management as a global issue, and rapidly developing underpinning techniques for advanced data management and modelling.

It retains direct relevance to the water sector through reference to such contexts as the EU Water Framework Directive and global Sustainable Development Goals.

Programme Regulations (link to on-line version)

-R5408FP.pdf (ncl.ac.uk)

13 Support for Student Learning

Generic information regarding University provision is available at the following link.
Generic Information

14 Methods for Evaluating and Improving the Quality and Standards of Teaching and Learning

Generic information regarding University provision is available at the following link.
Generic Information

Accreditation Reports
The continuation of accreditation 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 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, was approved in July 2017 for entrants from 2017 up to and including the 2021 intake. See www.jbm.org.uk for further information.

The programme is accredited by the Chartered Institution of Water and Environmental Management (CIWEM, www.ciwem.org.uk) as contributing to the academic requirements for the appropriate CIWEM membership grade for students that graduate from the Programme.

The programme is also accredited by the Royal Institution of Chartered Surveyors (RICS, http://www.rics.org/uk/) and the Geological Society (GeolSoc, www.geolsoc.org.uk).

Additional Mechanisms
None

15 Regulation of Assessment

Generic information regarding University provision is available at the following link.
Generic Information

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

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

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

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.