PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University, Université de Nice – Sophia Antipolis, Brandenburg Technische Universitat Cottbus, Universitat Politecnica de Cataluna, Warsaw University of Technology
2	**Teaching Institution**	Newcastle University, Université de Nice – Sophia Antipolis, Brandenburg Technische Universitat Cottbus, Universitat Politecnica de Cataluna, Warsaw University of Technology
3	**Final Award**	MSc
4	**Programme Title**	MSc in Hydroinformatics and Water Management (EuroAquae) MSC in Hydroinformatics and Water Management Science (EuroAquae) (exit award)
5	**Programme Code**	5140F 5182F (Granted – Admin code – see 5140F) 5469F (exit award)
6	**Programme Accreditation**	JBM
7	**QAA Subject Benchmark(s)**	Engineering
8	**FHEQ Level**	7
9	**Last updated**	May 2023

10 Programme Aims

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.

1) To provide opportunities for candidates with first degrees in a range of scientific and engineering disciplines to enhance their knowledge of the water environment through a programme involving theoretical, practical and computational (informatics) components;

2) To prepare and train future scientists and executive engineers in charge of modelling and managing projects in hydro-technologies and environment. These professionals have a vocation to assist local, regional, national and international collectives, public services and to be involved in private companies;

3) To offer experience in the planning and execution of an extended research project;

4) To provide experience of dissertation writing and other presentational skills;

5) To be part of the Erasmus Mundus programme, the European Union co-operation and mobility programme in the field of higher education;

6) To provide a programme which meets the Frameworks for Higher Education Qualifications (FHEQ) in UK, the French Ministry of Education standards and accreditation procedures (Ministry expertise every 4 years and Conseil National d'Evaluation CNE for the whole institution) in France, the Quality agencies of Spain, (any other regulation in the participating countries) at Masters level;

7) 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;

8) 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);
9) 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.

10) To provide a programme designed to meet 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

11) 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 have:

A1 A sound scientific understanding of key basic subject areas of mathematics, physics, hydrology, hydraulics, Information and Communication Technologies (ICT), and geographic information systems (GIS).

A2 An advanced knowledge and understanding and critical awareness of specialisations at the forefront of discipline in water management, software engineering and modelling, decision support systems, water and society.

A3 Quantitative training in mathematical methods, computational modelling and hydroinformatic techniques.

A4 Knowledge of specific examples of schemes for groundwater, urban and rural water management.

A5 Understanding of Web-based collaboration "any place – any time" potential in professional environment

Teaching and Learning Methods

Outcomes are reached through a series of 4 stages (semesters), carried out at different institutions. A.1 is addressed primarily during the "Basic acquisitions" phase in Semester 1. A2 and A3 are achieved during the Hydroinformatics phase of Semester 2. A.4 and A.5 are achieved in Semester 3 (Thematic specialism phase). All (A.1 to A.4) are reinforced and practiced during Semester 4 in "Professional practice and Research". Teaching is by a mixture of intensive one-week residential courses and conventional taught modules, both of these comprising lectures and tutorials. Acquisition of A.2 and A.4 is partly by the above techniques and partly by field visits, applied research projects carried out in universities and with industrial partners, and project work in professional practice.

Assessment Strategy

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 is essential for the completion of the dissertation.

Intellectual Skills

On completing the programme students will have:

B1 Ability to select and apply appropriate mathematical methods for modelling and analysing relevant problems;

B2 Use of scientific principles in the development of engineering and environmental solutions to practical problems in the water environment and water infrastructure operation;

B3 Use of scientific principles in the modelling and analysis of the water environment and of water infrastructure operation;

B4 Decision making in complex and unpredictable situations, leading to the ability to select and apply appropriate computer-based methods for modelling and analyzing problems in the water environment and in water infrastructure operation;

B5 Originality in the creation of new products or methodologies or research outputs through synthesis of ideas from a wide range of sources;

B6 Ability to produce solutions to problems through the application of engineering and water environment knowledge and understanding.

B7 Ability to build and manage team work in virtual environment

Teaching and Learning Methods

Fundamental aspects of B1 and B7 are developed in Semester 1 (Basic courses in maths/physics/hydraulics etc. and Collaborative Engineering.) Subsequently, B1– B6 are primarily acquired in Semesters 2 and 3 during the intensive modules addressing specialist themes and hydroinformatic methods: these include hands-on computer laboratories and design-based activities. B5 and B7 are further developed in design-based and problem-solving assignments in Semesters 2 and 3, and are also reinforced and practiced in Semester 4 during either a research project or professional practice.

Assessment Strategy

Closed-book examinations are used to assess intellectual abilities while assessed coursework provides further opportunities to demonstrate intellect and ability. The dissertation provides final evidence of the levels attained.

Practical Skills

On completing the programme students should have:

C1 The ability to use ICT tools and hydroinformatics technologies;

C2 The ability to design components of the water infrastructure and schemes for management of the water environment;

C3 Practical testing of design ideas through computer simulation with technical analysis and critical evaluation of results;

C4 The ability to evaluate critically the application of engineering and environmental techniques dealing with complex issues such as industrial, legislative and commercial constraints;

C5 The ability to plan, execute and present a research project;

C6 The ability to search for information and develop ideas further.

C7 The ability to manage project work in teams in decentralized environment using ICT.

Teaching and Learning Methods

C1 is taught principally through lectures and tutorials in Semester 1 and 2. C2-C4 are taught in Semesters 2 and 3 during more intensive modules addressing specialist themes and hydroinformatic methods: these include hands-on computer laboratories and design-based activities. C7 is covered in one module in semester 1 and another in semester 3. C5 and C6 are primarily developed and practiced in Semester 4 during the research project or projects in professional practice.

Assessment Strategy

C1 and C2 are explicitly assessed in Semester 1, 2 and 3 modules. Other outcomes C3-C7 are assessed through coursework and project requirements.

Transferable/Key Skills

On completing the programme students should be able to:

D1 manage, transform and present data in a variety of ways;

D2 use methods based on scientific evidence in the solution of problems;

D3 use initiative, creativity and innovation in problem solving;

D4 communicate effectively in English, or other languages as appropriate, (including written, oral and poster media);

D5 use generic ICT, GIS and programming skills;

D6 demonstrate independent learning and wider time and resource management skills

D7 demonstrate a collaborative approach to team working and project management.

Teaching and Learning Methods

Outcomes D1, D2 and D5 are developed and practiced in the first semester modules addressing basic essential subjects. D.4 (communication in English) is specifically addressed with a module in Semester 2, and then built upon in subsequent modules, particularly the project or professional practice in semester 4. D.7 is a specialist skill in high demand in the engineering profession, and is addressed specifically by an innovative international web-based collaborative study in Semester 1. All outcomes D.1 – D.7 are developed further and practiced in coursework assignments in Semesters 2 and 3. Subsequently, the principal development of transferable skills (and D.4 and D.6 in particular) occurs through involvement in the research project or professional practice.

Assessment Strategy

Skills D1–D3 are essential to complete examinations and assignments to a satisfactory standard. Acquisition of D4 is demonstrated during assessment of coursework and of the project. D5 is explicitly assessed in GIS and ICT modules in Semester 1.

Outcomes D5 and D6 are essential for satisfactory completion of the coursework sand the final project so they are indirectly assessed through coursework and project assessment. Completion of the project also requires command of outcomes D1–D4. D7 is trained in project work during Semester 3 but it is not explicitly assessed.

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

EuroAquae is a modular degree designed for flexible delivery at a number of institutions, allowing and encouraging mobility of students. It is part of the Erasmus Mundus programme, a co-operation and mobility

programme in the field of higher education which promotes the European Union as a centre of excellence in learning around the world.

Erasmus Mundus supports European top-quality Masters Courses and enhances the visibility and attractiveness of European higher education in third countries. It also provides EU-funded scholarships for third country nationals participating in these Masters Courses.

The masters programme spans 4 semesters, or 2 years, and has the following partners:

- University of Nice-Sophia Antipolis (UNSA, France)
- Brandenburg University of Technology Cottbus (BTUC, Germany)
- Warsaw University of Technology (WUT, Poland)
- Technical University of Catalonia (UPC, Spain)
- Newcastle University (NU, UK)

The programme is organized in a pedagogic continuum to provide introduction and common knowledge/soft skills (sem. 1 all locations except NU), acquisition and the use of hydroinformatics concepts, methods and tools (sem. 2 NU), a thematic specialisation: hydroinformatics systems, urban waters management, inland management, decision support systems (sem. 3 all locations except NU) and for semester 4 (all locations), a research project or professional practice. The consortium issues a joint degree (MSc.) defined as Master of Sciences in Hydro-Informatics & Water Management recognized by all the participating countries.

Every MSc student takes modules to a total value of 120 ECTS credits over four semesters (two years). Mobility is a fundamental concept of the programme which is used to develop and promote a common vision and professional capacity through a variety of specializations. The students must follow at least 30% (36 ECTS) of the curricula in a different institution from their “European home institution”. The mobility is applied in semesters 2, 3 and 4.

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. All students are required to discuss their pattern of study with their academic tutor to ensure that they are following an appropriate programme.

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

This course educates future developers and users of Hydroinformatics systems that are supporting management of the water environment in a sustainable manner worldwide. It has a solid foundation on the development of numerical, hydroinformatics and problem-solving skills which is attractive to industry. In addition, graduates are well-versed in the socio-economic and environmental disciplines which makes them very versatile and easily adaptable to changes in work environment.

EuroAquae is a unique degree designed for joint flexible delivery at a number of partner institutions, encouraging and requiring mobility of students. It is part of the Erasmus Mundus programme, a co-operation and mobility programme in the field of higher education which promotes the European Union as a centre of excellence in learning around the world.

Programme Regulations (link to on-line version)

EURO-AQUAE (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 2012 for entrants from 2012 up to and including the 2016 intake. See www.jbm.org.uk for further information.

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.