PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	MSc (Hons)
4	**Programme Title**	Environmental Engineering Environmental Engineering Science (exit award)
5	**Programme Code**	5038F/P 5310P (withdrawn from entry Sept 2025) 5474F (exit award)
6	**Programme Accreditation**	5038F/P – JBM / CIWEM
7	**QAA Subject Benchmark(s)**	Engineering
8	**FHEQ Level**	7
9	**Last updated**	September 2025

10 Programme Aims

1) To provide graduates from a variety of backgrounds with the advanced conceptual understanding, detailed technical knowledge and problem-solving skills to enable them to provide clean water, treat wastewater, manage solid waste, remediate contaminated land and control air pollution, for careers in environmental industries worldwide.

2) To ensure that the key skills of our students develop in parallel with their academic and technical abilities. These key skills include the ability to communicate effectively, the ability to employ IT and library resources appropriately, the ability to prioritise work and to meet deadlines, the ability to work alone and with others, and the ability to use initiative and to solve problems.

3) To provide a programme that meets the accreditation requirements of the Institute of Structural Engineers (IStructE) 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.

4) To provide an entry route into an appropriate professional institution such as the Royal Institution of Chartered Surveyors (RICS www.rics.org/uk).

5) 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

6) 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.

Knowledge and Understanding

On completing the programme students should:

A1 Have a comprehensive understanding of mathematical and scientific analytical methods appropriate to Environmental Engineering and research investigations

A2 Demonstrate advanced knowledge and critical awareness of Environmental Engineering theory of physical, chemical and biochemical processes and design in selected areas of study

A3 Have an understanding of applications of IT to the selected fields of study

A4 Know the principles of Engineering Project Management and Design including awareness of design data and the development of a basis of design

A5 Be aware of specific examples of Environmental Engineering design with consideration of principles of Integrated Pollution Prevention and Control

A6 Be aware of management principles and business practices, including professional and ethical responsibilities and aspects of sustainability

A7 Have an understanding of design, construction and operations practice and awareness of requirements for health and safety issues

Teaching and Learning Methods

Acquisition of A1 and A2 is through a combination of lectures, tutorials, example classes, group and individual presentations, laboratory activities and coursework. Outcome A3 is achieved by lectures, tutorials and, where appropriate, hands-on computer exercises. Acquisition of A4 and A5 is partly by lecture and tutorial, but depends increasingly on case studies, student investigations and oral and poster presentations. Individual investigations to greater depth are frequently needed during the design and research projects.

The broader professional outcomes, A6, are taught by lectures and tutorials supporting the Environmental Engineering Design and Project Management module and developed throughout the Programme in the Project Skills and Professional Development module and by participation in seminars. Outcome A7 is covered in lectures and developed in design tutorials, but is also central to experimental project investigations.

Assessment Strategy

Formative assessment occurs through tutorial examples, coursework and a major dissertation. The primary means of assessing factual knowledge is the closed book examination. This is supported by assessed coursework, the Design Project, and case studies, which involve oral, written and poster presentations.

Intellectual Skills

On completing the programme students should be able to:

B1 Understand and use engineering and scientific principles in the development of solutions to practical problems

B2 Select and apply appropriate designs to solve problems in Environmental Engineering context

B3 Use scientific principles in the modelling and analysis of Environmental Engineering systems and processes

B4 Select and develop appropriate computer-based methods for modelling and analysis of problems

B5 Demonstrate an appreciation of the need for multi-disciplinary inputs where appropriate, in the creation of new design criteria and analytical methods

B6 Produce solutions to problems through the application of engineering and scientific knowledge and understanding

B7 Demonstrate originality in the application of knowledge

B8 Evaluate critically current research

B9 Evaluate current methodologies and develop critiques of them

Teaching and Learning Methods

Outcomes B1 – B4 are initially encountered in lectures, laboratory and design classes and through case studies, but are developed principally during the Environmental Engineering Design and Project Management projects. Acquisition of B5 is introduced through lectures and case studies and may form a major part of the project. B6 is introduced in lectures and developed through tutorials, case studies, the design and the project. Outcomes B7-B9 will be developed through lecture material and further developed during the dissertation module.

Assessment Strategy

Unseen examinations are used to assess intellectual abilities. Assessed coursework and designs provides further opportunities to demonstrate intellect and ability. The project, which is assessed by dissertation, oral and poster presentations, provides final evidence of the levels attained.

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 present a research project
C4 Use engineering IT tools where appropriate
C5 Design a system, component or process in an Environmental Engineering context
C6 Test innovative ideas through laboratory work or simulation followed by technical analysis and critical evaluation of results
C7 Deal with complex issues both systematically and creatively
C8 Demonstrate decision making in complex and unpredictable situations
C9 Make sound judgments in the absence of complete data
C10 Demonstrate self-direction and originality in tackling and solving problems
C11 Act autonomously in planning and implementing tasks
C12 Apply engineering techniques taking account of environmental, industrial and commercial constraints

Teaching and Learning Methods

Outcomes C1-C3, and C7 are acquired principally through laboratory work and experience of the project. Acquisition of C4 is initially through lectures, developed through hands-on exercises and assignments. Further individual learning may also form a significant part of the project. C5 is introduced through lectures and developed through case studies. It will frequently form a central part of the project. Lectures and tutorials provide initial experience of C6 – C11, but the project forms the principal vehicle for their acquisition. Outcome C12 is introduced through lectures and the Design and Project Management module. Some projects may require further individual learning in this area.

Assessment Strategy

Outcome C1-C2 are assessed in part through coursework from teaching laboratories, and again in the final Dissertation. C3 is assessed in the Project Brief presentations and Materials and Methods section of the final Dissertation. C4 is assessed through coursework in the Air Pollution module, and can add to the value of the Environmental Engineering Design and Project Management projects. Outcomes C5 to C8 are assessed through coursework from individual modules, and especially through the Design and Research Projects. C9-11 are assessed in the dissertation.

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
D8 Exercise initiative and personal responsibility
D9 Work effectively as a part of a team

Teaching and Learning Methods

Outcomes D1-D9 are introduced through examples in lectures and reinforced by coursework tasks throughout the Programme, but particularly through involvement in the Design (especially D9) and Research (excluding D9) project modules. Outcomes D4, D5 and D7 are particularly developed in the Project Skills and Professional Development module.

Assessment Strategy

Skills D1-D3 are essential to complete examination and assignments to a satisfactory standard. Skills D4 and D6 are assessed as part of a number of coursework tasks.
Outcomes D5-D8 are essential to satisfactorily complete coursework tasks, especially for the Research project, which also requires command of outcomes D1-D4.
D9 is part of the assessment for the Environmental Engineering for Developing Countries module, and is an essential element of the Design and Project Management module assessment.
The Professional Portfolio, assessed by interview in the Professional Development module, requires the students to reflect on the majority of the Transferable Skills above.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

The full time MSc is a 12 month programme consisting of 180 credits. The taught component is made up of one 20 credit and eight 10 credit compulsory taught modules, and one optional 10 credit taught module (from a choice of three). This is complemented by a 70 credit research Project and Dissertation. The period of study for the part-time mode shall normally be 2 years.

Most of the taught modules are delivered as intensive one-week short courses, followed by a week of further reading and/or coursework. The course is therefore ideally suited for those working in industry to attend on a part time basis over a longer period of ideally 2 but up to 4 years. Most of the modules are also available as one-week CPD courses.

Although most modules are designed to work as 'stand-alone' short courses, some modules (particularly the Environmental Engineering Design and Project Management and the Dissertation modules) require some prior knowledge from other modules, so for part time students, the order in which modules are taken needs to be planned in discussion with the Degree Programme Director.

Depending on a student's first degree, the first module (Core Concepts in Environmental Engineering) provides essential core knowledge and skills required to undertake other modules, particularly modules with laboratory-based teaching.

The next six taught modules (Introduction to Practical Hydraulics, Air Pollution, Solid Waste Management, Water Supply and Treatment, Wastewater Engineering, and Environmental Engineering for Developing Countries) introduce students to the breadth and depth of topics within Environmental Engineering, and equip them with a breadth of knowledge, technical and problem-solving skills. These modules are assessed by a combination of examination and coursework.

The central 20 credit module (Environmental Engineering Design and Project Management) introduces project management and design skills, and gives students the opportunity to apply knowledge and skills from other modules in a creative project-team setting, and then further

within their individual design reports. The Project Skills and Professional Development module is the only 10 credit module that is not taught entirely within a single week block, and instead runs with multiple sessions across Semester 1 and 2 to prepare students for their coursework tasks early in the year, and then provide training in the generic skills relevant to the Project and Dissertation in the second semester. Its focus is also on employability skills, the participation in seminars, and preparation for accreditation by professional bodies.

The final taught module is a choice from three (Contaminated Land, Pollution Control Engineering for Groundwaters and Surface Waters, and Environmental Fate of Contaminants). Pollution Control Engineering for Groundwaters and Surface Waters puts particular emphasis on remediation design, Contaminated Land, puts particular emphasis on conducting risk assessment, and Environmental Fate of Contaminants teaches the use of advanced analytical instruments and techniques for trace chemical analysis.

The research Project and Dissertation offers students a unique opportunity to gain specialised skills and knowledge through individual research and is a challenging and rewarding experience. Students carry out their research in our own well-equipped laboratories, UK field sites, with industrial partners or overseas collaborators, and are assessed by the dissertation, an academic poster and an oral presentation.

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

Newcastle University has a tradition in training environmental engineers since 1963. Today, the demand for good environmental engineers is greater than ever, for the future of the environment, health and quality of life of the world's population.

The Environmental Engineering Programme at Newcastle is unique in its breadth while maintaining its focus on environmental engineering. In addition to the engineering and scientific aspects, we emphasize the social, economic and institutional context in developed and in developing countries. Our industrial collaborators provide guest speakers, field visits and project support.

Central to the Programme is the Environmental Engineering Design and Project Management module, which challenges the students to apply knowledge and skills from the other modules to an unfamiliar problem, and integrates project management, design skills and team working into the process.

From the start of the Programme, students are encouraged to become active student members of CIWEM, record and reflect on their professional development, and consider their route to full membership of a professional institution, through the completion of a Professional Portfolio aligned to CIWEM competencies. This aspect is assessed, and forms part of the employability skills focussed module Project Skills and Professional Development.

Newcastle University is a world leader in Engineering Biology and this theme permeates modules focusing on engineered systems for water, wastewater, and solid waste treatment within the programme.

Programme regulations (link to on-line version)

-R5038FP_5310P.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 programme is accredited 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. See http://www.jbm.org.uk/ for further information.

The programme is accredited by the Chartered Institution of Water and Environmental Management (CIWEM, http://www.ciwem.org/) 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, https://www.rics.org/uk/).

Additional mechanisms
Strategic and pedagogical review takes place annually via School and Environmental Engineering staff group Teaching Away Days.

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: University Regulations | University Regulations | Newcastle University

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.