PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	Master of Research
4	**Programme Title**	Technology in the Marine Environment
5	**Programme Code**	4805F
6	**Programme Accreditation**	Not Applicable
7	**QAA Subject Benchmark(s)**	Not Applicable
8	**FHEQ Level**	7
9	**Last updated**	May 2023

10 Programme Aims

The course is designed for highflying graduates from a range of disciplines intending to play a high profile role in project management and research in the field of Marine Technology. The course is generic in nature and large part of it will be appropriate to many other sectors of industry.

It is intended that the course will provide a firm basis for the professional development of graduates intending to follow a career in industry by following one of two routes.

1) The first is to complete the course, qualify with an MRes, and move from there into industry
2) The second route is to follow the MRes by a further period of research, in an area defined by experience and contacts established during the course, and leading to a doctorate.

It is envisaged that they would then move into industry to implement state of the art technology tailored to industrial requirements, developed over the previous four years. Whilst the emphasis of the course is on the former route, experience of the Department in collaboration with industry has shown the second route to be a very effective vehicle for technology transfer for carefully targeted projects.

Degree Programme Objectives

The course aims to provide its students with the basic skills and knowledge of the tools required to carry out a research project in an industrial context. In order to achieve this objective it is necessary for them to understand the environment in which they will operate and to appreciate the techniques that will enable them to do so effectively. They will learn:

- The basic tools for managing any project
- To study the specialised techniques for undertaking projects with a strong research basis
- To analyse and define the objectives of a project
- To design and to plan it according to rational methodologies
- To carry it out in accordance with practicable and efficient procedures
- To analyse and interpret the results and to present them in a meaningful manner

During the course they will participate in project work that, in addition to achieving certain technical and educational objectives, will be designed to develop interpersonal and transferable skills.

11 Learning Outcomes

The programme comprises four main elements; Research Techniques, Advanced Knowledge, Advanced Skills, and Transferable and Personal Skills. It is designed to provide opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas. The codes in parentheses following the programme outcomes refer to the QAA benchmark statements for Engineering. The typical (modal) student will have:

Knowledge and Understanding

A1 Mathematics and physics appropriate to marine technology and related fields

A2 Detailed knowledge and understanding of facts, concepts, principles and theories relevant to the student's chosen area of specialisation within Marine Technology;

A3 Knowledge of IT applications to the selected field of study

A4 Conceptual and detailed design appropriate to their area of specialisation

A5 Where appropriate, management principles and business practises, including professional and ethical responsibilities

A6 The role of marine technologists in society and the constraints within which their engineering judgement will be exercised

A7 Production practise including codes of practise, standards and regulatory framework

A8 The assessment of safety risks and the legislative framework for safety

B Subject-Specific/Professional Skills

Within the context of his chosen discipline, a successful student will be able to:

B1 Use appropriate mathematical methods for modelling and analysing problems in marine technology

B2 Select appropriate experimental set-up and procedures

B3 Carry out laboratory experiments in a professional manner

B4 Write computer software and use it, or commercial packages, for appropriate tasks

B5 Design a system, component or process in selected fields

B6 Test design ideas practically through laboratory work or simulation with technical analysis and to evaluate the results critically

B7 Search for information for the further development of ideas

B8 Apply engineering techniques taking account of industrial and commercial constraints

B9 Manage projects effectively

C Cognitive Skills

A successful student will be able to:

C1 Select and apply appropriate mathematical methods for modelling and analysing relevant problems

C2 Use scientific principles in the development of engineering solutions to practical problems

C3 Use scientific principles in the modelling and analysis of engineering systems, processes and products

C4 Select and apply appropriate computer based methods for modelling and analysing problems in selected fields

C5 Be creative in the solution of problems and in the development of designs

C6 Integrate and evaluate information and data from a variety of sources

C7 Take a holistic approach to solving problems and designing systems, applying professional judgements to balance risks, costs, benefits, safety, reliability, aesthetics and environmental impact

D Key (transferable) skills:

A successful student will be able to:

D1 Manipulation and presentation of data in variety of ways

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

D3 Use of general IT Skills

D4 Use of creativity and innovation in problem solving

D5 Working with limited or contradictory information

D6 Effective communication

D7 Engineering approach to the solution of problems

D8 Time and resource management

Teaching and Learning Methods

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 through lectures, tutorials, case studies, laboratory experiments and student investigations and presentations.
Outcome A.6 depends primarily on lectures and tutorial studies.
The broader professional outcomes, A.7, are taught by lectures and coursework studies.
Outcome A.8 is formally taught in lectures and developed in tutorials, but is also central to experimental project investigations.

Throughout the learner is encouraged to undertake independent reading both to supplement and consolidate what is being taught/learnt and to broaden their individual knowledge and understanding of the subject.

Where appropriate, B1 is reinforced in lectures, but learning is principally in tutorials and assignments. The abilities characterised by B2 – B4 are initially encountered in lectures, practical classes and case studies, but are developed principally during the research project. Acquisition of B5 occurs through lectures and case studies and may form a major part of the project. Experimental, research and design skills are further

developed through coursework activities, laboratory experiments, and research and design projects. Individual feedback is given to students on all work produced. Creative and design skills are developed through design and project work. These activities develop the abilities listed in B6-B9.

The skills associated with C1-C3 are acquired principally through experience gained in coursework and the project. IT skills (C4) are developed initially through lectures and through hands-on exercises and assignments. Further individual learning may also form a significant part of the project. Skill in designing products or processes is acquired through lectures, and developed through case studies and/or the project. Case studies provide initial opportunities for developing the skills associated with C6 and C7, but the project forms the principal vehicle for their acquisition. Some projects may require further individual learning in this area. Effective project management is learnt through course works and the project.

Assessment Strategy

Formative assessment occurs through tutorial examples and coursework. The primary means of assessing factual knowledge is the closed book examination. This is supported by assessed coursework and case studies, which involve both written and oral presentations. In depth individual learning frequently forms part of the project, which is assessed through a dissertation and viva voce examination.

Formal examinations are most commonly used to assess intellectual abilities. Assessed coursework provides further opportunities to demonstrate intellect and ability. The project, which is assessed by dissertation and viva voce examination, provides final evidence of the levels attained.

Practical skills are assessed through laboratory experiment write-ups, coursework reports, project reports and presentations.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

The one-year course is a modular one integrated with the university semester system but continuing for a period of a further three months beyond the end of the second semester. The course has a component involving formally taught modules and a component in which students exercise and develop the skills they have acquired in carrying out a research project. The course comprises of three compulsory modules (140 credits) and a choice of 40 credits from eight additional modules. The research project will start in the second semester.

The Research Project, which receives a weighting of 110 credits, lasts throughout the calendar year, beginning in earnest at the beginning of the second semester. It is carried out in collaboration with an industrial partner who, along with the academic supervisor, participates in the definition of the project specification and the supervision of the project.

The structure of the course differs from conventional MEng and MPhil courses, or the first year of a PhD course, in that the taught part explicitly comprises four components that might be described under the headings Research Techniques, Advanced Knowledge, Advanced Skills, and Transferable and Personal Skills.

This structure conforms to the original EPSRC guidelines on developing MRes courses.

The module options offered are designed to take into account student aspirations (whether they wish to continue to study for a PhD, or enter directly into industry) and the subject area of their research project.

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

Much of this programme is generic in nature and aims to develop the skills and knowledge of graduates from a wide range of engineering, science, and relevant business management backgrounds. It enables you to carry out research-related project work in the multidisciplinary field of technology in a sustainable marine environment. The programme offers high-quality training in research methods and practice, as well as transferable and personal skills. It is also a highly desirable qualification for further studies at PhD level or a career in research and development.

Programme regulations (link to on-line version)

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
Accreditation was given by IMarEST/RINA in 2021. Accreditation is for 5 years and the next re-accreditation visit is due in 2026.

Additional mechanisms

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.