

**PROGRAMME SPECIFICATION**

1	<b>Awarding Institution</b>	Newcastle University
2	<b>Teaching Institution</b>	Newcastle University
3	<b>Final Award</b>	Master of Research
4	<b>Programme Title</b>	Technology in the Marine Environment
5	<b>UCAS/Programme Code</b>	4805
6	<b>Programme Accreditation</b>	Not Applicable
7	<b>QAA Subject Benchmark(s)</b>	Not Applicable
8	<b>FHEQ Level</b>	M
9	<b>Date written/revised</b>	August 2014

**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 a 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.

- The first is to complete the course, qualify with an MRes, and move from there into industry.
- 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 bias;
- 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

1. Mathematics and physics appropriate to marine technology and related fields (A1);
2. Detailed knowledge and understanding of facts, concepts, principles and theories relevant to the student's chosen area of specialisation within Marine Technology (A2);
3. Knowledge of IT applications to the selected fields of study (A3);
4. Conceptual and detailed design of artefacts appropriate to their area of specialisation (A4, A5);
5. Where appropriate, management principles and business practices, including professional and ethical responsibilities (A6);
6. The role of marine technologists in society and the constraints within which their engineering judgement will be exercised (A7);
7. Production practice including codes of practice and regulatory framework (A8, A9);
8. The assessment of safety risks, and the legislative framework for safety (A10).

### 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 To 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 an 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 a 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. The skills required for C8 are acquired initially through lectures and developed by case studies. 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 by 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)**

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

### **13 Criteria for admission**

#### *Entry qualifications*

A minimum of an upper-second-class Honours degree, or equivalent, from a recognised higher education institution. A marine technology or engineering degree is not mandatory, and applications from science, mathematics or environmental-based graduates are welcome.

#### *Admissions policy/selection tools*

DPD selection.

#### *Level of English Language capability*

Applicants whose first language is not English require IELTS 6.0, TOEFL 550 (paper-based) or 213 (computer-based), or equivalent.

### **14 Support for Student Learning**

The Student Services portal provides links to key services and other information and is available at: <http://www.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 Development Centre (further information is available from the Robinson Library).

#### *Academic and Pastoral support*

Each undergraduate and taught postgraduate student will be assigned a personal tutor.\* A personal tutor is one part of a wider network of advice and guidance available to students to support their personal and general academic development. The module leader acts as the first point of contact for subject-specific academic advice. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Student-Staff Committee, and/or at the Board of Studies. Within the academic unit, students may also receive additional academic and pastoral advice from a range of other student-facing staff including degree programme directors, dissertation/project supervisors, and administrative support staff.

\*Arrangements may vary for students taking special types of provision.

The University also offers a wide range of institutional services and support upon which students can call, such as the Writing Development Centre, Careers Service and Student Wellbeing Service. This includes 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 Student Union 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 team 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-session 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 Student-Staff Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Learning, Teaching and Student Experience Committee.

#### *Programme reviews*

The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Learning, Teaching and Student Experience Committee. The FLTSEC takes an overview of all programmes within the Faculty and reports any Faculty or institutional issues to the Faculty Learning, Teaching and Student Experience Committee.

#### *External Examiner reports*

External Examiner reports are considered by the Board of Studies. The Board responds to these reports through Faculty Learning, Teaching and Student Experience Committee. External Examiner reports are shared with institutional student representatives, through the Student-Staff Committee.

#### *Student evaluations*

All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Student-Staff 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 Student-Staff Committee and the Board of Studies.

#### *Faculty and University Review Mechanisms*

Every six years degree programmes in each subject area undergo periodic review. This involves both the detailed consideration of a range of documentation, and a review visit by a review team (normally one day in duration) which includes an external subject specialist and a student representative. Following the review a report is produced, which forms the basis for a decision by University Learning, Teaching and Student Experience Committee on whether the programmes reviewed should be re-approved for a further six year period.

*Accreditation reports*

*Additional mechanisms*

## **16 Regulation of assessment**

### *Pass mark*

The pass mark is 50 (Postgraduate programmes)

### *Course requirements*

Progression is subject to the University's Masters Degree Progress Regulations, Taught and Research and Examination Conventions for Taught Masters Degrees. There are reassessment opportunities, with certain restrictions. Limited compensation up to 40 credits of the taught element and down to a mark of 40% is possible for candidates who commenced their programme in 2013/14 or earlier. For students starting their programme in 2014/15 or later, no compensation is possible.

### *Common Marking Scheme*

The University employs a common marking scheme, which is specified in the Taught Postgraduate Examination Conventions, namely:

### **Summary description applicable to postgraduate Masters programmes**

<50	Fail
50-59	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, after recommendation from the Board of Studies. The External Examiner is expected to:

- See and approve examination papers
- Moderate examination and coursework marking
- Attend the Board of Examiners
- 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:

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.

### Mapping of Intended Learning Outcomes onto Curriculum/Modules

Module	Type	Intended Learning Outcomes			
		A	B	C	D
MAR8064	Compulsory	1,2,3,5	1,7,9	2,6	1,2,3,6,8
MAR8005	Compulsory		2,3,6	2,6	1
CME8010	Optional	2		7	
CME8012	Optional	2,6			
CME8019	Optional	2			
CME8037	Optional	2		5	
CME8038	Optional	2,8,9			
MAR8068	Optional	2,3	1,2,3,4	1,2,3,4	2
MAR8072	Optional	1,2,4,5	1,2,3,4	1,2,3,4	2
MAR8071	Optional	1,2,4,5	1,2,3,4	1,2,3,4	2

MAR8064 – Research Skills and Commercial Awareness

MAR8005 – Design and Implementation of Experiments

CME8010 – Pollution Monitoring

CME8012 – Business and Environmental Management

CME8019 – Energy Management

CME8037 – Sustainable Design and Manufacture I

CME8038 – Sustainable Industry

MAR8068 – Advanced Hydrodynamics

MAR8072 – Fundamentals of Naval Architecture

MAR8071 – Fundamentals of Marine Engineering