	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	**UCAS/Programme Code**	4805
6	**Programme Accreditation**	Not Applicable
7	**QAA Subject Benchmark(s)**	Not Applicable
8	**FHEQ Level**	M
9	**Date written/revised**	September 2007

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 twenty modules in all. Eight of them are taught and the remaining twelve are devoted to the research project. Six modules will normally be taught in the first semester and two in the second, depending on choice of optional modules. The research project will start in the second semester.

The Research Project, which receives a weighting of twelve modules, 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 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.

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.

Help with academic writing is available from the Writing Centre. Details can be obtained from Alicia.Cresswell@ncl.ac.uk

Academic support
The initial point of contact for a student is with a lecturer or module leader, or their tutor (see below) for more generic issues. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Staff-Student Committee, and/or at the Board of Studies.

Pastoral support
All students are assigned a personal tutor whose responsibility is to monitor the academic performance and overall well-being of their tutees.
In addition the University offers a range of support services, including the Student Advice Centre, the Counselling and Wellbeing team, the Mature Student Support Officer, and a Childcare Support Officer.

Support for students with disabilities
The University's Disability Support Service 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-sessional 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 School Teaching and Learning Committee and at the Board of Studies. Student opinion is sought at the Staff-Student Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Teaching and Learning Committee.

Programme reviews
The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Teaching and Learning Committee.

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

Student evaluations
All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Staff-Student Committee, and the Board of Studies. The National Student Survey is sent out every year to final-year undergraduate students, and consists of a set of questions seeking the students' views on the quality of the learning and teaching in their HEIs. Further information is at www.thestudentsurvey.com/ With reference to the outcomes of the NSS and institutional student satisfaction surveys actions are taken at all appropriate levels by the institution.

Mechanisms for gaining student feedback
Feedback is channelled via the Staff-Student Committee and the Board of Studies.

Faculty and University Review Mechanisms
The programme is subject to the University's Internal Subject Review process.

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. Limited compensation up to 40 credits of the taught element and down to a mark of 40 is possible and there are reassessment opportunities, with certain restrictions.

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

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

The University Prospectus (see http://www.ncl.ac.uk/undergraduate/)

The School Brochure (contact enquiries@ncl.ac.uk)

The University Regulations (see http://www.ncl.ac.uk/calendar/university.regs/)

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**
MAR8015	Compulsory	1,3	7,9	2,6	1,2,3,6,8
MAR8035	Compulsory	2,5	1		
MAR8005	Compulsory		3,6	2	
CME8010	Optional	2			
CME8012	Optional	2			
CME8019	Optional	2			
MAR8006	Optional	1,3	3,6		
CME4018	Optional	2			
LAW8035	Optional	2			
MAR3007	Optional	2,8			
MAR8007	Optional	2			
MAR8018	Optional	2	1		

MAR8015 – Research Skills
MAR8035 – Management & Communication
MAR8005 – Design and Implementation of Experiments
CME8010 – Pollution Monitoring
CME8012 – Business and Environmental Management
CME8019 – Energy Management
MAR8006 – Data Analysis and Interpretation
CME4018 – Multivariate Methods
LAW8035 – Foundations of Environmental Law and Policy
MAR3007 – Formal Safety Assessment & Design for Safety
MAR8007 – Marine Production Technology
MAR8018 – Optimal Marine Design