

PROGRAMME SPECIFICATION

1	Awarding Institution	Newcastle University
2	Teaching Institution	Newcastle University
3	Final Award	Integrated PhD
4	Programme Title	Integrated PhD Engineering Science in the Marine Environment
5	UCAS/Programme Code	8071
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 overall aims of the multi-disciplinary programme are to produce graduates who have developed well founded knowledge, skills and understanding within one or more specific subject areas of marine technology in its widest sense. The coupling of a sound theoretical grasp of the subject with practical application, awareness of responsibilities to society and the environment, and the requirement for flexibility, are regarded as essential to the process of becoming a professional marine technologist.

Specifically, the programme aims:

- To equip students having diverse backgrounds with knowledge skills and understanding in their chosen programme.
- To equip students with appropriate transferable practical skills in computing and information technology, data collection and analysis, problem formulation and solving and communication skills, both oral and written.
- To enable students to enhance their learning experience, particularly with respect to project, by benefiting from the School's exceptional research led teaching.
- To encourage students to develop awareness and responsible attitudes towards the needs of society and the environment in the application of their engineering knowledge, including a regard for safety appropriate to their profession.
- To produce graduates who are recognised by the maritime industry worldwide as fully equipped to contribute at a professional engineering level, especially where a research degree is required.
- To instil in students an awareness of their professional responsibilities and the need for their own continuing professional development.
- To contribute to the working environment within the Department, such that students enjoy the University learning experience and wish to maintain contact with the Department in its future activities, professionally as well as socially.

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 appropriate to the course title.

Knowledge and Understanding

On completing the programme students should:

A successful student will have gained and be able to demonstrate:

- A1 Mathematics and physics appropriate to marine science and 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 Science/ Technology;
- A3 Knowledge of IT applications to the selected fields of study;
- A4 Conceptual and detailed design of artefacts appropriate to their area of specialisation;
- A5 Where appropriate, management principles and business practices, including professional and ethical responsibilities;
- A6 The role of marine scientists/engineers in society and the constraints within which their engineering judgement will be exercised;
- A7 Production practice including codes of practice 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 experimental work 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 student 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.

The transferable skills associated with (D5, D6, D9) are developed in project-based coursework. All the other transferable skills are covered in a dedicated module on research skills.

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, for selected students, viva voce examination.

Formal examinations are used to assess intellectual abilities. Assessed coursework provides further opportunities to demonstrate intellect and ability. The project, which is assessed by dissertation and, for selected students, 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.

The modes of assessment, pass marks and rules relating to reassessment for the taught elements of the degree shall be as set out in the degree programme regulations for the degree of Doctor of Philosophy (Integrated).

The results of a student's advanced study and research must be embodied in a thesis in the approved form in accordance with the *Rules for the Submission of Work for Higher Degrees* and the *Rules for the Form of Theses* (see items XIV and XV).

12 Programme Curriculum, Structure and Features

Basic structure of the programme

This 3 year programme is part taught, part research based, and enables students to develop their own interest in a specific marine-related area of study, and gain detailed knowledge and experience of research methods and management. Students also have the opportunity to widen their knowledge in areas that are of relevance to an academic or professional career.

Candidates take taught modules to a total of 200 credits (80 credits in Year 1; 75 credits in Year 2; 45 credits in Year 3).

The research element comprises an original piece of work combining both experiment and theory. The thesis should explore, in detail, some element of engineering or science as applied in the marine environment. Wherever appropriate, students are encouraged to take advantage of the Schools's strong links with the marine industry to carry out the research project in an industrial context.

Key features of the programme (including what makes the programme distinctive)
Programme regulations (link to on-line version)
http://www.ncl.ac.uk/regulations/programme/

13 Criteria for admission
<p><i>Entry qualifications</i> Normally an upper-second-class Honours degree or higher in a relevant engineering or science discipline. Equivalent qualifications also considered on a case-by-case basis. <i>Admissions policy/selection tools</i></p> <p>DPD selection.</p> <p><i>Level of English Language capability</i> Applicants whose first language is not English require IELTS 6.5, TOEFL 575 (paper-based) or 233 (computer-based), or equivalent</p>

14 Support for Student Learning
<p>The Student Services portal provides links to key services and other information and is available at: http://www.ncl.ac.uk/students/</p> <p><i>Induction</i> 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.</p> <p><i>Study skills support</i> 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.</p> <p>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).</p> <p><i>Academic and Pastoral support</i> 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.</p> <p>*Arrangements may vary for students taking special types of provision.</p>

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
MAR8015	Compulsory	1,3,5,6	7,9	2,4, 6,7	1,2,3,6,7,8
MAR8035	Compulsory	2,5,7,8	1,8,9		6,7,8
MAR8005	Compulsory	1,3	1,2,3,4,6	1,2,5	4,5,7
MAR8006	Compulsory	1,3,	1,3,4,6	1,3,4,6	1,2,5
Optional Modules		2,4,7,8	4,5,8	2,3,7	3,6

MAR8015 – Research Skills

MAR8035 – Management & Communication

MAR8005 – Design and Implementation of Experiments

MAR8006 – Data Analysis & Interpretation