

UNIVERSITY OF
NEWCASTLE UPON TYNE

FACULTY OF
SCIENCE, AGRICULTURE & ENGINEERING

DEGREE PROGRAMME SPECIFICATION

UNIVERSITY OF
NEWCASTLE



1. Awarding Institution	University of Newcastle upon Tyne
2. Teaching Institution	University of Newcastle upon Tyne
3. Final Award	B.Eng (Hons)
4. Programme Title	Marine Technology (International) with Honours in: Marine Engineering (code J610)
5. Programme Accredited by:	
6. UCAS Code	J610
7. QAA Benchmarking Group(s)	Engineering
8. Date of production/revision	August 2004

9. Programme Aims:

The programme aims:

- To produce graduates who have developed well founded knowledge skills and understanding within one or more specific subject areas of Marine Technology,
- To couple a sound theoretical grasp of the subject with practical application, awareness of responsibilities to society and the environment, and the requirement for flexibility,
- To prepare students for one of four well recognised sectors of the marine industries worldwide, namely Marine Engineering, Naval Architecture, Offshore Engineering and Small Craft Technology,
- To provide a programme which meets the FHEQ at Honours level and which takes appropriate account of the subject benchmark statements in Engineering (E) document as referenced in (<http://www.qaa.ac.uk/crntwork/benchmark/engineering.pdf>)

This degree programme is designed to allow accepted students with approved international qualifications, such as Ngee Ann Polytechnic Advanced Diploma in Ship and Marine Technology or the Singapore Maritime Academy Specialist Diploma in Marine Engineering and Naval Architecture, or equivalent, to graduate having completed 180 credits in a Calendar Year (equivalent to 3 Semesters)

10. Intended Learning Outcomes; Teaching and Learning Strategies and Methods; Assessment Strategies and Methods

To meet the aims outlined above, the degree programmes all have the following objectives:

- i. To equip students with knowledge skills and understanding in their chosen programme.
- ii. To ensure students receive the core material recommended by the accrediting professional institutions (the Institute of Marine Engineers and the Royal Institution of Naval Architects).
- iii. To enable students to enhance their projects by facilitating the School's exceptional research base to inform teaching and lecturing activities.
- iv. 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.
- v. 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.
- vi. To instil in students an awareness of their professional responsibilities and the need for their own continuing professional development.
- vii. To contribute to the working environment within the School, such that students enjoy the University learning experience and wish to maintain contact with the School in its future activities, professionally as well as socially.

A Knowledge and understanding

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

- A1. Basic Mathematics and Physics that are relevant to Marine Technology (E);
- A2. The fundamental concepts, principles and theories of Marine Technology (E);
- A3. Business and management techniques that are relevant to marine technology and marine technologists (E);
- A4. Detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to the student's chosen area of specialisation within Marine Technology (E);
- A5. The role of marine technologists in society and the constraints within which their engineering judgement will be exercised (E);
- A6. The professional and ethical responsibilities of marine technologists (E);
- A7. The environmental issues that affect Marine Technology and the issues associated with sustainable engineering solutions;
- A8. Conceptual and detailed design of artefacts appropriate to their area of specialisation;
- A9. Production practice including codes of practice, design, the assessment of safety risks, and the legislative framework for safety.

Teaching/learning methods and strategies

Students study a selection of modules from those normally studied at Stages 2 and 3 of the traditional 3-year Bend programme as appropriate to their prior knowledge and chosen Honours option.

Acquisition of 1 and 2 is through a combination of lectures, tutorials, example classes, laboratory experiments, coursework and projects at institutions where students gain their pre-qualifications, e.g. Ngee Ann Polytechnic / The Singapore Maritime Academy, as well as through lectures, tutorials, example classes, laboratory experiments, coursework and projects associated with Stage 2 modules studied at Newcastle

Acquisition of 3 is through a combination of lectures, supervisions, coursework and projects in Stage 3 modules

Acquisition of 4 is through a combination of lectures, laboratory experiments, coursework and projects in Stage 3 modules.

Acquisition of 5 and 6 is through lectures coursework associated with both Stages 2 and 3 modules.

Acquisition of 7 is through a combination of lectures, seminars, coursework and projects associated with Stage 3 modules.

Acquisition of 8 is through the Stage 3 design project and lectures and coursework associated with Stages 2 and 3 modules.

Acquisition of 9 is addressed in lectures associated with Stages 2 and 3 modules.

Assessment strategy

Testing the knowledge base is through a combination of unseen written examinations (1-4, 9) and assessed coursework (1-9) in the form of laboratory experiment write-ups (1, 2, 4), examinations (8), coursework reports (3-9) and project reports and presentations (2, 3, 4, 7,8).

B Subject –specific/professional skills

A successful student will be able to:

- B1. Plan, conduct and report a programme of investigative work;
- B2. Analyse and solve engineering problems (E);
- B3. Design a structure or component to meet a need (E);
- B4. Be creative in the solution of problems and in the development of designs (E);
- B5. Evaluate designs and make improvements (E);
- B6. Integrate and evaluate information and data from a variety of sources (E);
- B7. Take an holistic approach to solving problems and designing systems, applying professional judgements to balance risks, costs, benefits, safety, reliability, aesthetics and environmental impact (E).

Teaching/learning methods and strategies

Skills B1 and B2 are developed during laboratory experiments, coursework and projects at institutions where students gain their pre-qualifications, e.g. Ngee Ann Polytechnic / The Singapore Maritime Academy, as well as through lectures, tutorials, example classes, laboratory experiments, coursework and projects associated with Stage 2 and Stage 3 modules studied at Newcastle

Skills B3, B4 and B5 are developed through engineering applications and marine engineering design as

well as research project and dissertation modules which students study during Stage 2 and Stage 3 at Newcastle

Skill B6 are developed through coursework activities, laboratory experiments, and research and design projects at institutions where students gain their pre-qualifications e.g. Ngee Ann Polytechnic / The Singapore Maritime Academy, as well as through tutorials, example classes, laboratory experiments, coursework and projects associated with Stage 2 and Stage 3 modules studied at Newcastle

Skill B7 are developed through design and project work carried out during Stage 3 at Newcastle.

Assessment strategy

Analysis and problem solving skills are assessed through unseen written examinations and coursework. Experimental, research and design skills are assessed through laboratory experiment write-ups, coursework reports and project reports, presentations and unseen written examinations. Creative and design skills are assessed through coursework and unseen written examinations.

C Cognitive skills

A successful student will be able to:

- C1. Execute safely a series of experiments (E);
- C2. Use laboratory equipment to generate data (E);
- C3. Analyse experimental or computational results and determine their strength and validity(E);
- C4. Prepare technical drawings;
- C5. Prepare technical reports;
- C6. Give technical presentations;
- C7. Use the scientific literature effectively;
- C8. Use computational tools and packages (E);
- C9. Produce a conceptual or elemental design to a specification;
- C10. Search for information to develop concepts.

Teaching/learning methods and strategies

Practical skills are developed throughout the programme of study.

Practical experimental skills (1-3) are developed through laboratory experiments and project work. Skill 4 is taught through lectures and developed through drawing coursework exercises.

Skills 5 and 6 are taught through Stage 2 and 3 modules and then developed through feedback on reports written and presentations made as part of coursework assignments.

Skill 7 is developed through research project work.

Skill 8 is taught and developed through coursework exercises and project work.

Skill 9 is taught and developed through the Stage 3 design project and Stage 2 and 3 lectures and coursework.

Skill 10 is practised through the design project.

Assessment strategy

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

D Key (transferable) skills

A successful student will be able to:

- D1. Communicate effectively (in writing, verbally and through drawings) (E);
- D2. Apply mathematical skills (algebra, geometry, modelling, analysis);
- D3. Work as a member of a team (E);
- D4. Use Information and Communications Technology (E);
- D5. Manage resources and time (E);
- D6. Learn independently in familiar and unfamiliar situations with open-mindedness and in the spirit of critical enquiry (E);
- D7. Learn effectively for the purpose of continuing professional development and in a wider context throughout their career (E).

Teaching/learning methods and strategies

Transferable skills are developed throughout the programme of study.

Skill 1 is taught through classes and the design project in Stage 3 and then developed through feedback on reports written and presentations made as part of coursework assignments.

Skill 2 is taught through lectures and tutorials and developed throughout the course.

Skill 3 is developed through group project work.

Skill 4 is developed in many modules and is a skill developed as essential part of project work and report writing

Skill 5 is developed through laboratory experiments, projects and other coursework activities and individual learning.

Skill 6 is introduced in Stage 1 and developed throughout the course with particular emphasis in Stage 3 on the investigative project.

Skill 7 is developed through lectures and tutorials and developed throughout the course.

Assessment strategy

Skill 1 is assessed through coursework reports, presentations and oral examinations.

Skill 2 is assessed primarily through examinations.

Skill 4 is assessed through examinations and through research project work.

The other skills are not formally assessed but are fundamental to successful completion of the programme and, particularly, project work..

11 Programme Features, Structure and Curriculum

A Programme Features

Candidates only enter these Undergraduate Degree Programmes having obtained an International qualification providing the necessary prerequisite knowledge.

B Programme Structure

The structure of these Undergraduate Degree Programmes is linked to a 12 month pattern that is based on a 3 semester system. Undergraduate students following these programmes must take modules with a total credit value of 180, normally at the rate of 60 credits per semester. After successful completion of three semesters full-time study, students will receive a degree of Bachelor of Engineering (BEng).

A University credit is the equivalent of 10 student study notional hours. Each module is a self-contained part of the programme of study and carries a credit rating, (Details can be found in Newcastle University undergraduate examination conventions)

The choice of optional modules will be subject to the approval of the Degree Programme Director in order to ensure that all intended programme learning outcomes are met by each student.

C Programme Curriculum

- (a) All candidates shall take modules with a total value of 180 credits according to Honours degree programme as follows:

MARINE ENGINEERING (J610)

Modules with a total value of 50 credits chosen, with the approval of the Degree Programme Director, from the following Stage 2 list:

Code	Credits	Descriptive titles
CSC601	(10)	Introduction to C++
EEE235	(10)	Electrical Engineering II
ENG201	(10)	Introduction to Business Management
MAR202	(10)	Marine Engineering IIA
MAR203	(10)	Marine Engineering IIB
MAR205	(10)	Marine Production Technology I
MAR206	(10)	Marine Structures IA
MAR212	(10)	Engineering Applications
MAR213	(10)	Powering of Marine Vehicles
MAR214	(10)	Analytical Methods in Marine Technology
MMM 211	(10)	Materials Science II
MMM251	(10)	Dynamics & Control II

plus compulsory modules with a total value of 110 credits:

MAR301	(20)	Marine Engineering Design
MAR306	(50)	Research Project & Dissertation
MAR312	(10)	Dynamic Modelling & Simulation
MAR313	(10)	Internal Combustion Engines
MAR316	(10)	Marine Engineering III
MAR330	(5)	Stability of Marine Vehicles
MAR331	(5)	Naval Architecture III

plus optional modules with a total value of 20 credits, chosen with the approval of the Degree

Programme Director, from the Stage 3 module list in (b) below.

(b) Optional modules in approved combinations may be chosen from the following Stage3 module list:

BUS310	(10)	Strategic Management and Organization Theory
EEE335	(10)	Applied Electronics
MAR311	(10)	Drilling Engineering
MAR312	(10)	Dynamic Modelling & Simulation
MAR313	(10)	Internal Combustion Engines
MAR314	(10)	Marine Design Concepts
MAR315	(10)	Maritime Economics and Safety
MAR316	(10)	Marine Engineering III
MAR318	(10)	Marine Production Technology II
MAR319	(10)	Marine Structures IIA
MAR320	(10)	Marine Structures IIB
MAR321	(10)	Marine Transport
MAR322	(10)	Maritime Systems Analysis
MAR324	(10)	Offshore Engineering Analysis
MAR325	(10)	Offshore Studies
MAR326	(10)	Offshore Vehicle Design
MAR327	(10)	Resistance and Propulsion II
MAR328	(10)	Small Craft Hydromechanics
MAR329	(10)	High Speed and Advanced Craft
MAR330	(5)	Stability of Marine Vehicles
MAR331	(5)	Naval Architecture III
MAR332	(5)	Formal Safety Assessment and Design for Safety
MAR333	(5)	Surface Generation and Fairing
MMM211	(10)	Materials Science II
MMM334	(10)	Automatic Control
MMM373	(10)	Joining Technology
MMM449	(10)	Thermal Power and Propulsive Systems

Candidates may select alternative modules as approved by the Degree Programme Director

Development of specific Intended Learning Outcomes occurs through the following modules (compulsory modules in bold text, optional modules in normal text):

A1	Basic Mathematics and Physics that are relevant to Marine Technology	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy
A2	The fundamental concepts, principles and theories of Marine Technology	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy, plus MAR201, MAR202, MAR203, MAR206, MAR213, MAR316, MAR320, MAR322, MAR327, MAR330, MAR331
A3	Business and management techniques that are relevant to marine technology and marine technologists	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MAR315, MAR321, relevant electives
A4	Detailed knowledge and understanding of the essential facts, concepts, principles and theories	MAR201, MAR202, MAR203, MAR211, MAR301, MAR312, MAR313, MAR311, MAR314, MAR322, MAR324, MAR326, MAR327, MAR330

	relevant to the student's chosen area of specialisation within Marine Technology	
A5	The role of marine technologists in society and the constraints within which their engineering judgement will be exercised	MAR212, MAR301, MAR315, MAR321
A6	The professional and ethical responsibilities of marine technologists	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MAR301, MAR315, MAR332
A7	The environmental issues that affect Marine Technology and the issues associated with sustainable engineering solutions	MAR206, MAR212, MAR301, MAR314, MAR319, MAR306
A8	Conceptual and detailed design of artefacts appropriate to their area of specialisation	MAR206, MAR212, MAR301, MAR314, MAR319, MAR330, MAR306
A9	Production practice including codes of practice, design, the assessment of safety risks, and the legislative framework for safety.	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MAR205, MAR301, MAR315, MAR318, MAR332
B1	Plan, conduct and report a programme of investigative work	MAR212, MAR325, MAR306 & courseworks
B2	Analyse and solve engineering problem	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MMM251, MAR202, MAR203, MAR206, MAR213, MAR301, MAR302, MAR303, MAR304, MAR311, MAR312, MAR313, MAR315, MAR316, MAR318, MAR319, MAR321, MAR322, MAR324, MAR325, MAR327, MAR306 & relevant electives
B3	Design a structure or component to meet a need	MAR212, MAR301, MAR306 & courseworks
B4	Be creative in the solution of problems and in the development of designs	MAR212, MAR301, MAR306
B5	Evaluate designs and make improvements	MAR212, MAR301, MAR306
B6	Integrate and evaluate information and data from a variety of sources	MAR301, MAR306 & courseworks
B7	Take an holistic approach to solving problems and designing systems, applying professional judgements to balance risks, costs, benefits, safety, reliability, aesthetics and environmental impact	MAR301, MAR306
C1	Execute safely a series of experiments (E)	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MAR202/3, MAR212, MAR327
C2	Use laboratory equipment to generate	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy

	data (E)	plus MAR202/3, MAR210, MAR211, MAR212, MAR327
C3	Analyse experimental or computational results and determine their strength and validity	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MAR202/3, MAR212
C4	Prepare technical drawings	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MAR301, MAR306, MAR330
C5	Prepare technical reports	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MAR301, MAR306 & courseworks
C6	Give technical presentations	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MAR301, MAR325, MAR306
C7	Use the scientific literature effectively	MAR301, MAR306, courseworks
C8	Use computational tools and packages	CSC601, MAR206, MAR212, MAR312, MAR301, MAR306
C9	Produce a conceptual or elemental design to a specification	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MAR206, MAR212, MAR301, MAR306
C10	Search for information to develop concepts	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MAR301, MAR306 & courseworks
D1	Communicate effectively (in writing, verbally and through drawings)	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MAR325, MAR301, MAR306 & courseworks
D2	Apply mathematical skills (algebra, geometry, modelling, analysis)	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus EEE235, MMM251, MAR202, MAR203, MAR206, MAR213, MAR301, MAR311, MAR312, MAR313, MAR316, MAR 318, MAR319, MAR321, MAR322, MAR325, MAR326, MAR327, MAR306 & relevant electives
D3	Work as a member of a team (E)	MAR212, MAR301
D4	Use Information and Communications Technology	Subjects taken in pre-qualifying institutions ie Ngee Ann Polytechnic, The Singapore Maritime Academy plus MAR301, MAR306
D5	Manage resources and time	BUS310, MAR301, MAR306 & courseworks
D6	Learn independently in familiar and unfamiliar situations with open-mindedness and in the spirit of critical enquiry	MAR301, MAR306
D7	Learn effectively for the purpose of continuing professional development and in a wider context throughout their career (E)	Induction Programme, all modules

12 Criteria for Admission:

Students will be considered on a case by case basis. Key criteria will be academic qualifications approved for matriculation (equivalent to the Advanced Diploma in Ship & Marine Technology, awarded by Ngee Ann Polytechnic, or the Advanced Diploma in Marine Engineering, awarded by Singapore Maritime Academy) and a personal statement. The minimum English Language proficiency requirement is IELTS 6.5 (or equivalent) for applicants whose first language is not English.

13 Support for Students and their Learning:

Services and facilities available to students include the following:

- School's Information Officer
- School's Computing Manager
- Student/staff ratio of 16:1
- Study skills instruction in Stage 1 and University Web based materials;
- Degree Programme Handbook (including Degree Regulations and Module sheets);
- Marine Science and Technology Library (including tutorial solutions and other support materials);
- Extensive laboratories;

Induction

The first week of the first term/semester is an Induction Week with no formal teaching. During this period all students will be given detailed programme information relating to their Stage and the timetable of lectures/practicals/labs/ tutorials/etc. In particular all new students will be given general information about the School and their course, as described in the Degree Programme Handbook. The International Office offers an additional induction programme for overseas students (see http://www.ncl.ac.uk/international/coming_to_newcastle/orientation.phtml).

Study skills support

Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification.

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 it is to monitor the academic performance and overall well-being of their tutees. Details of the personal tutor system can be found at <http://www.ncl.ac.uk/undergraduate/support/tutor.phtml>. In addition the University offers a range of support services, including the Student Advice Centre, the Student Counselling Service, the Mature Student Support Service, and a Childcare Support Officer, see: <http://www.ncl.ac.uk/undergraduate/support/welfare.phtml>.

Support for Special Needs

Support for students with special needs is provided as required and the University's Disability Support Service can be consulted where appropriate. For further details see <http://www.ncl.ac.uk/undergraduate/support/disability.phtml>.

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, see <http://www.ncl.ac.uk/undergraduate/support/acfacilities.phtml>.

All new students whose first language is not English are required to take an English Language test in the Language Centre. Where appropriate, in-session language training can be provided. The Language Centre houses a range of resources for learning other languages which may be particularly appropriate for those interested in an Erasmus exchanges. See

<http://www.ncl.ac.uk/undergraduate/support/langcen.phtml>.

15 Regulation of Assessment:

Pass Marks

The pass mark, as defined in the University's Undergraduate Examination Conventions (<http://www.ncl.ac.uk/calendar/university.regs/ugexamconv.html>), is 40.

Course Requirements

Progression is subject to the University's Undergraduate Progress Regulations (<http://www.ncl.ac.uk/calendar/university.regs/ugcont.html>) and Undergraduate Examination Conventions (<http://www.ncl.ac.uk/calendar/university.regs/ugexamconv.html>).

Weighting of Modules

All modules studied on the programme will be given equal weight in assessing final Honours classification

Common Marking Scheme

The University employs a common marking scheme, which is specified in the Undergraduate Examination Conventions (<http://www.ncl.ac.uk/calendar/university.regs/ugcont.html>), namely

	Honours	Non-honours
<40	Fail	Failing
40-49	Third Class	Basic
50-59	Second Class, Second Division	Good
60-69	Second Class, First Division	Very Good
70+	First Class	Excellent

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:

- Approval of Examination Papers
- Vetting in-course assessments and examination scripts
- Interviewing a selection of candidates prior to the June Examination Board
- Attending the Board of Examiners meeting and participating in its deliberations
- Reviewing any subsequent special cases, either by correspondence or in special circumstances by subsequent visits to Newcastle.
- Returning a confidential report to the VC.

16 Indicators of Quality and Standards:

Internal Review Reports

All the modules offered in this programme was covered by the Internal Subject Review (ISR) of “Marine Science and Technology” held on April 2004 and was subsequently approved by Faculty Teaching and Learning Committee and University Teaching and Learning Committee. Summary of ISR’s commendations relevant to these programmes are as follows:

- The methods by which research is promoted and clearly developed and progressed throughout the programmes.
- The wide range of recruitment activities that the School is involved in.
- The range of physical resources that the School has access to, especially as these resources are used to support not only research but also teaching.
- Liaison by the School librarian with the academics within the School.
- The support staff for their role within the School.

Previous QAA Reports

All the modules offered by this programme received a QAA Subject Review in 1998 and was judged to be satisfactory

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.

17 Other Sources of Information:

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

The School Web Site (see <http://www.ncl.ac.uk/marine>)

The University and Degree Programme Regulations (see <http://www.ncl.ac.uk/calendar/pdf/uniregs.pdf> and <http://www.ncl.ac.uk/calendar/sae/>)

The Degree Programme Handbook

QAA Subject Review Report