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**	M.Eng (Hons)
4.	**Programme Title**	Marine Technology (codes H353, H352) Naval Architecture (code H514) Marine Engineering (code H354) Offshore Engineering (code JH6H) Small Craft Technology (code H524)
5.	**Programme Accredited by:**	RINA, IMarEST
6.	**UCAS Code**	As shown in 5 above, the first code number is for the 4 year course with Foundation year, the second is for the 4 year course.
7.	**QAA Benchmarking Group(s)**	Engineering including Annex B4 – MEng degrees
8.	**Date of production/revision**	August 2004

9. Programme Aims:

The programme aims:

- To produce graduates who have a systematic understanding of knowledge, and a critical awareness of current problems at, or informed by, the forefront of one or more specific subject areas of Marine Technology,
- a comprehensive understanding of techniques applicable to their own advanced scholarship and originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline,
- 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 prepares a student for one of four well recognised sectors of the marine industries worldwide, namely Marine Engineering, Naval Architecture, Offshore Engineering and Small Craft Technology, or for two or more of these sectors of the Marine Technology industry,
- To provide a programme which meets the FHEQ at Masters level and which takes appropriate account of the subject benchmark statements in Engineering (E), including Annex B4 (B), document as referenced in (http://www.qaa.ac.uk/crntwork/benchmark/engineering.pdf)

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 having diverse backgrounds with knowledge skills and understanding in their chosen programme that will enable them to be able to deal with complex issues both systematically and creatively, to make sound judgements in the absence of complete data, and to communicate their conclusions clearly to specialist and non-specialist audiences;

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, and to demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level;

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), and for effective group participation including independent action, accepting responsibilities, formulating ideas proactively, planning and developing strategies, implementing and executing agreed plans, leading and managing teams where required, evaluating achievement against specification and plan, and decision making;

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 of knowledge and skills to a high level;

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. A comprehensive knowledge and understanding of Mathematical models and Physics principles that are relevant to Marine Technology and an appreciation of their limitations (E and B4);

A2. The comprehensive understanding of the fundamental concepts, principles and theories of Marine Technology (E and B4);

A3. Extensive knowledge and understanding of business and management techniques that are relevant to marine technology and marine technologists (E and B4);

A4. Detailed knowledge and understanding of the essential facts, concepts, principles and theories, including engineering materials, relevant to the student's chosen area of specialisation within Marine Technology (E and B4);

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. (E and B4);

A9. Production practice including codes of practice, design, the assessment of safety risks, and the legislative framework for safety.

Teaching/learning methods and strategies

Acquisition of 1 and 2 is through a combination of lectures, tutorials, example classes, laboratory experiments, coursework and projects in Stages 1 and 2.

Acquisition of 3 is through a combination of lectures, supervisions, coursework and projects in Stages 3 and 4.

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

Acquisition of 5 and 6 is through lectures throughout the programme and coursework in Stage 3.

Acquisition of 7 is through a combination of lectures, seminars, coursework and projects especially in Stages 3.

Acquisition of 8 is through the Group project in Stage 4, the design projects in Stages 3 and 4 and lectures and coursework in Stages 2 and 3.

Acquisition of 9 is addressed in lectures throughout the course.

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 a programme of investigative work and report the results by integrating presentational techniques for maximum impact (E and B4);

B2. Analyse and solve engineering problems by

- using fundamental knowledge to investigate new and emerging technologies;
- extracting, from given data, that which is pertinent to an unfamiliar problem, using computer based engineering tools when appropriate;
- selecting appropriate data from a range of possible data sets and presenting them in alternative forms to create deeper understanding and/or greater impact;

(E and B4);

B3. Generate an innovative design for systems, components or processes to fulfil new needs (E and B4);

B4. Be creative in the solution of problems and in the development of designs by:

- applying engineering techniques taking account of a range of commercial and industrial constraints;
- researching and using new methods required for novel situations and adapting to specific purposes if necessary;
- recognising the capabilities and limitations of computer based methods for engineering problem solving, witn awareness of the future developments of IT tools;
- learning new theories, concepts, methods etc in an unfamiliar situation outside the discipline area.

(E and B4);

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

Intellectual skills are developed through the teaching and learning programme outlined above (and in section 11).

Analysis and problem solving skills are further developed through example, classes, tutorials, coursework and project work.

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.

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. Take notes effectively;

C9. Use computational tools and packages and have:

- a comprehensive knowledge and understanding of the role and limitations of ITC,
- an awareness of developing technologies in ITC,
- an understanding of the capabilities of computer based models for solving problems in engineering,
- the ability to assess the limitations of particular cases (E and B4);

C10. Produce a conceptual or elemental design to a specification;

C11. Search for information to develop concepts.

Teaching/learning methods and strategies

Practical skills are developed through the teaching and learning programme outlined above (and in section 11).
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 classes in Stage 1 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 in Stage 1 and practised throughout the programme.

Skill 9 is taught and developed through coursework exercises and project work.

Skill 10 is taught and developed through the design project in Stages 3 and lectures and coursework in Stages 2 and 3.

Skill 11 is practised the through 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 and through drawings, and verbally by integrating presentational techniques and the information to be presented for maximum impact (E and B4);

D2. Apply mathematical skills (algebra, geometry, modelling, analysis);

D3. Work as a member of a team with strong capabilities for independent action, accepting responsibilities, formulating ideas proactively, planning and developing strategies, implementing and executing agreed plans, leading and managing teams where required, evaluating achievement against specification and plan, and decision making (E and B4);

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 through the teaching and learning programme outlined above (and in section 11).

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 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.

Although not explicitly taught, the other skills are nurtured 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.

Programmes outcomes for different exit points

Level C	You will have a sound knowledge of the basic concepts in Engineering and Ship Science, and will have learned how to take different approaches to solving problems. You will be able to communicate accurately, and will have the qualities needed for employment requiring the exercise of some personal responsibility.
Level I	You will have developed a sound understanding of the principles involved in a range of core Marine Technology subjects, and will have learned to apply those principles more widely. Through this, you will have learned to evaluate the appropriateness of different approaches to solving problems. You will have the qualities necessary for employment in situations requiring the exercise of personal responsibility and decision-making.
Level H	You will have developed an understanding of a complex body of knowledge relevant to Marine Technology, some of it at the forefront of current developments. Through this, you will have developed analytical techniques and problem-solving skills that can be applied to a range of engineering problems. As graduate (BEng) you will be able to evaluate evidence, arguments and assumptions, to reach sound judgements, and to communicate effectively. You should have the qualities needed for employment in situations requiring the exercise of personal responsibility, and decision-making in complex and unpredictable circumstances.
Level M	Much of the study undertaken at Masters level reflects research at the forefront of Engineering and, in particular, Ship Science. You will have shown originality in the application of knowledge, and you will understand how the boundaries of

	knowledge are advanced through research. You will be able to deal with complex issues both systematically and creatively, and show originality in tackling and solving problems, individually and as part of a team. You will have the qualities needed for employment in circumstances requiring sound judgement, personal responsibility and initiative, in complex and unpredictable professional environments.

11 Programme Features, Structure and Curriculum

A Programme Features

The normal Undergraduate year is approximately 31 weeks, arranged in three terms and currently divided into two Semesters. The course normally lasts four years, although it is possible to take a gap year or spend time abroad at an approved university.

Every Honours student studies 120 credits in each Stage (or year), resulting in M.Eng. candidates completing 480 credits. Candidates must complete one Stage before proceeding to the next; the only part-time study is limited provision for the repetition of failed modules.

All students follow the same programmes in Stages 1. In the second year, students elect to follow a specialisation within Marine Technology. This is enhanced and extended in Stage 3 and 4. It is possible for a student to leave the programme after three years with a B.Eng. Honours degree by transferring to this programme at the end of Stage 2.

There is a Faculty Foundation Year for candidates not adequately qualified to embark on Stage 1 of Degree Programmes.

B Programme Structure

The programme is structured on a semester pattern. You study modules comprising 120 credits in each of Stage I (level C), II (level I), III (level H) and IV (level M). After successful completion of four years full-time study, students will receive a degree of Master of Engineering (MEng).
In addition there are the following exit points:

- Certificate of Higher education, following successful completion of Stage I ;
- Diploma of Higher education, following successful completion of Stage II ;

The duration of all the courses may be extended by one year through enrolment on the Engineering Foundation Year.
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.

C Programme Curriculum

Stage 1

All candidates shall take the following compulsory modules:

Code	*Credits*	*Descriptive title*
MAR101	(20)	Marine Engineering I
MAR103	(20)	Naval Architecture I
MAR104	(5)	Introduction to Computing
MAR105	(5)	Marine Statistics
EEE136	(10)	Electrical Engineering I
ENM105	(20)	Engineering Mathematics I
MMM114	(10)	Materials Science I
MMM118	(5)	Introduction to Machine Design
MMM151/ MMM124	(15)	Mechanics I
MMM152/ MMM155	(10)	Manufacturing Technology & Management I

Stage 2

All candidates shall take the following compulsory modules:

Code	*Credits*	*Descriptive title*
MAR205	(10)	Marine Production Technology I
MAR212	(10)	Engineering Applications
MAR214	(10)	Analytical Methods in MarineTechnology
CSC601	(10)	Introduction to Programming in C++
ENG201	(10)	Introduction to Business Management

All candidates shall take further compulsory modules to the value of 70 credits chosen according to Honours degree programme as follows:

Marine Engineering

Code	*Credits*	*Descriptive title*
MAR202	(10)	Marine Engineering IIA
MAR203	(10)	Marine Engineering IIB
MAR206	(10)	Marine Structures IA
MAR213	(10)	Powering of Marine Vehicles
EEE235	(10)	Electrical Engineering II
MMM211	(10)	Materials Science II
MMM251	(10)	Dynamics and Control II

Naval Architecture

Code	*Credits*	*Descriptive title*
MAR201	(10)	Marine Dynamics
MAR202	(10)	Marine Engineering IIA
MAR206	(10)	Marine Structures IA
MAR207	(10)	Marine Structures IB
MAR208	(10)	Naval Architecture II
MAR210	(20)	Resistance and Propulsion I

Offshore Engineering

Code	*Credits*	*Descriptive title*
MAR201	(10)	Marine Dynamics
MAR203	(10)	Marine Engineering IIB
MAR206	(10)	Marine Structures IA
MAR207	(10)	Marine Structures IB
MAR209	(10)	Offshore Mechanics
MAR213	(10)	Powering of Marine Vehicles
CIV221	(10)	Soil Mechanics

Small Craft Technology

Code	*Credits*	*Descriptive title*
MAR201	(10)	Marine Dynamics
MAR206	(10)	Marine Structures IA
MAR207	(10)	Marine Structures IB
MAR208	(10)	Naval Architecture II
MAR210	(20)	Resistance and Propulsion I
MAR211	(10)	Small Craft Science

Marine Technology

Candidates shall select one Honours degree programme from Marine Engineering, Naval Architecture, Offshore Engineering or Small Craft Design, and take the compulsory modules to the value of 70 credits prescribed above for that programme.

To proceed to Stage 3 of the Master of engineering programme, candidates must be deemed to have passed all subjects in Stage 2 with an overall Merit performance as defined by the Faculty of Engineering Progress and Concessions Committee.

Stage 3

All candidates shall take the following compulsory module:

Code	Credits	Descriptive title
MAR398	(30)	Project and Report

All candidates must choose optional modules to a total value of 20 credits from the Technical Subject List below.

All candidates must choose optional modules to a total value of 10 credits from the Business and Management Subject List below.

All candidates must choose optional modules to a total value of 20 credits from the Technical Subject List, the Business and Management Subject List, and the Additional Approved Subject List below. Other modules will be considered for approval by the Degree Programme Director.

All candidates must take further compulsory modules to the value of 40 credits chosen according to the Honours degree programme as follows:

Marine Engineering

Code	*Credits*	*Descriptive title*
MAR301	(20)	Marine Engineering Design
MAR316	(10)	Marine Engineering III
MAR330	(5)	Stability of Marine Vehicles
MAR331	(5)	Naval Architecture III

Naval Architecture

Code	*Credits*	*Descriptive title*
MAR302	(20)	Marine Design
MAR318	(10)	Marine Production Technology II
MAR319	(10)	Marine Structures IIA

Offshore Engineering

Code	*Credits*	*Descriptive title*
MAR303	(20)	Offshore Design
MAR319	(10)	Marine Structures IIA
MAR324	(10)	Offshore Engineering Analysis

Small Craft Technology

Code	*Credits*	*Descriptive title*
MAR304	(20)	Small Craft Design

MAR318	(10)	Marine Production Technology II
MAR319	(10)	Marine Structures IIA

Marine Technology
The design module which corresponds to the programme of study followed at Stage 2 and is one of the following:

Code	*Credits*	*Descriptive title*
MAR301	(20)	Marine Engineering Design
MAR302	(20)	Marine Design
MAR303	(20)	Offshore Design
MAR304	(20)	Small Craft Design

Plus additional modules to a total value of 20 credits chosen from the Technical Subject List below.

Stage 4

All Candidates shall take the following compulsory modules:

Code	*Credits*	*Descriptive title*
MAR499	(40)	Group Project and Report

All candidates shall choose optional modules to a total value of 20 credits from the Technical Subject List below.

All candidates shall choose optional modules to a total value of 20 credits from the Business and Management Subject List below.

All candidates shall choose optional modules to a total value of 20 credits from the Technical Subject List, the Business and Management Subject List, and the Additional Approved Subject below. Other modules will be considered for approval by the Degree Programme Director.

All candidates shall take further compulsory modules to the value of 20 credits chosen according to the Honours degree programme as follows:

Marine Engineering

Code	*Credits*	*Descriptive title*
MAR312	(10)	Dynamic Modelling and Simulation
MAR313	(10)	Internal Combustion Engines

Naval Architecture

Code	*Credits*	*Descriptive title*
MAR315	(10)	Maritime Economics and Safety
MAR316	(10)	Marine Engineering III

Offshore Engineering

Code	*Credits*	*Descriptive title*
MAR311	(10)	Drilling Engineering
MAR326	(10)	Offshore Vehicle Design

Small Craft Technology

Code	*Credits*	*Descriptive title*
MAR328	(10)	Small Craft Hydromechanics

MAR329	(10)	High speed and Advanced Craft

Marine Technology

Code	*Credits*	*Descriptive title*
MAR401	(10)	Marine Manufacturing Systems
MAR402	(10)	Computer Aided Engineering

MEng Module Subject Lists for Stages 3 and 4

Selection of Modules

Modules can only be selected from the lists below provided the following three criteria are met:

The module has not been previously attempted.
All necessary pre-requisites for the module are complied with.
All selected modules are timetable compatible (i.e. there are no lecture/coursework clashes).

Technical Subject List

Available at Stage 3 and 4:

Code	**Credit**	**Title**
MAR311	10	Drilling Engineering
MAR312	10	Dynamic Modelling and Simulation
MAR 313	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
MAR322	10	Maritime Systems Analysis
MAR324	10	Offshore Systems 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

Note:

- MAR315 and MAR332 are mutually exclusive
- MAR327 and MAR328 are mutually exclusive
- MAR333 and MAR402 are mutually exclusive

Available at Stage 4 only:

Code	**Credit**	**Title**
MAR301	20	Marine Engineering Design
MAR302	20	Marine Design
MAR303	20	Offshore Design

MAR304	20	Small Craft Design
MAR401	10	Marine Manufacturing Systems
MAR402	10	Computer Aided Engineering
MAR826	20	Marine Machinery Systems
MAR861	20	Marine Transmission Systems
MAR842	10	Ship Performance at Sea
MAR845	10	Structural response Analysis
MAR846	10	Structural Design Synthesis – Ships
MAR847	10	Structural Design Synthesis – Offshore
MAR855	10	Advanced Offshore Design

Business and Management Subject List

Available at Stage 3 and 4:

Code	Credit	Title
BUS310	10	Strategic Management & Organisational Theory
ECO324	10	Economics for Engineers
MAR321	10	Marine Transport

Available at Stage 4 only:

Code	Credit	Title
NSM838	10	Finance
MAR804	10	Quality Assurance and Product Liability
CPE818	10	Business and the Environmental Management
ENG402	10	Management of New Product Introduction

Additional Approved Subject List

Available at Stage 3 and 4:

Code	Credit	Title
EEE335	10	Applied Electronics
ENM308	5	Multivariate Analysis
ENM309	5	Design of Experiments
ENM319	5	Optimisation
ENM340	5	Stochastic Processes
MMM211	10	Materials Science II
CPE401	10	Joining Technology I
MMM403	10	Thermal Power and Propulsion Systems

Available at Stage 4 only:

Code	Credit	Title
ENM851	10	Industrial Statistics
ENM852	5	Total Quality Management I
ENM853	5	Total Quality Management II
MAR805	10	Design and Implementation of Experiments
MAR806	10	Data Analysis and Interpretation
ENG401	10	Advanced Computer Aided Engineering

Note:

- ENM309 and MAR805 are mutually exclusive
- ENM340 and MAR806 are mutually exclusive
- ENG401 and MAR402 are mutually exclusive

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

A1	A comprehensive knowledge and understanding of Mathematical models and Physics principles that are relevant to Marine Technology and an appreciation of their limitations	**ENM105, EEE136, MMM114, MMM151/124, MMM211, EEE235**, **MAR105,** *relevant electives*
A2	The comprehensive understanding of the fundamental concepts, principles and theories of Marine Technology	**MAR101, MAR103, MAR105, MAR201, MAR202, MAR203, MAR206, MAR207, MAR208, MAR213, MAR316**, *MAR320, MAR322, MAR327, MAR330, MAR331*
A3	Extensive knowledge and understanding of business and management techniques that are relevant to marine technology and marine technologists	**MMM155, ENG201, BUS310**, *MAR315, MAR321,NSM838, CPE818, ENG402, MAR804, ENM852, ENM853, relevant electives*
A4	Detailed knowledge and understanding of the essential facts, concepts, principles and theories, including engineering materials, relevant to the student's chosen area of specialisation within Marine Technology	**MAR201, MAR202, MAR203, MAR207, MAR208, MAR209, MAR211, MAR301, MAR302, MAR303, MAR304, MAR311**, **MAR312, MAR313**, *MAR314, MAR322, MAR324, MAR326, MAR327, MAR328, MAR329, MAR330, MAR826, MAR861, MAR842, MAR845, MAR846, MAR847, MAR855*
A5	The role of marine technologists in society and the constraints within which their engineering judgement will be exercised	MAR212, **MAR301, MAR302, MAR303, MAR304,** *MAR315***,** *MAR321*
A6	The professional and ethical responsibilities of marine technologists	**MAR101, MAR103, MAR301, MAR302, MAR303, MAR304,** *MAR315, MAR332*
A7	The environmental issues that affect Marine Technology and the issues associated with sustainable engineering solutions	**MAR206, MAR207, MAR212**, **MAR301, MAR302, MAR303, MAR304,** *MAR314***, MAR319, MAR398**
A8	A wide knowledge and comprehensive understanding of the design process and the ability to undertake conceptual and detailed design of artefacts appropriate to their area of specialisation	**MAR206, MAR207, MAR212**, **MAR301, MAR302, MAR303, MAR304,** *MAR314, MAR319,MAR330,* **MAR398, MAR499**
A9	Production practice including codes of practice, design, the assessment of safety risks, and the legislative	**MMM152, MAR101, MAR103**, **MAR205**, **MAR301, MAR302,**

	framework for safety.	**MAR303, MAR304, MAR315,** *MAR318, MAR332, ENG402, MAR804*
B1	Plan, conduct a programme of investigative work and report the results by integrating presentational techniques for maximum impact	**MAR212,** MAR325, **MAR398, MAR499** & **courseworks**
B2	Analyse and solve engineering problems	**EEE136, MMM151/124, EEE235, MMM251, CIV221, MAR101, MAR103, MAR201, MAR202, MAR203, MAR206, MAR207, MAR208, MAR210, MAR213, MAR209, MAR211**, **MAR301, MAR302, MAR303, MAR304**, **MAR311, MAR312, MAR313, MAR315, MAR316, MAR 318, MAR319,** *MAR321, MAR322,* **MAR324**, *MAR325*, **MAR326**, MAR327, **MAR328, MAR329, MAR398, MAR499** & *relevant electives*
B3	Generate an innovative design for systems, components or processes to fulfil new needs	**MAR212, MAR301, MAR302, MAR303, MAR304, MAR398, MAR499 & courseworks**
B4	Be creative in the solution of problems and in the development of designs	**MAR212, MAR301, MAR302, MAR303, MAR304, MAR398, MAR499**
B5	Evaluate designs and make improvements	**MAR212, MAR301, MAR302, MAR303, MAR304, MAR398, MAR499**
B6	Integrate and evaluate information and data from a variety of sources	**MAR301, MAR302, MAR303, MAR304, MAR398, MAR499 & 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, MAR302, MAR303, MAR304, MAR398, MAR499**
C1	Execute safely a series of experiments (E)	**MAR101, MAR103, MAR202/3, MAR210, MAR211, MAR212, MAR327**
C2	Use laboratory equipment to generate data (E)	**MAR101, MAR103, MAR202/3, MAR210, MAR211, MAR212, MAR327**
C3	Analyse experimental or computational results and determine their strength and validity	**MAR101, MAR103, , MAR202/3, MAR209, MAR210, MAR211, MAR212, MAR327**
C4	Prepare technical drawings	**MAR103, MAR301, MAR302, MAR303, MAR304, MAR398**, MAR330
C5	Prepare technical reports	**MAR103, MAR301, MAR302 MAR303, MAR304, MAR398 & courseworks**
C6	Give technical presentations	**MAR103, MAR301, MAR325,**

		MAR398
C7	Use the scientific literature effectively	**MAR301, MAR302, MAR303, MAR304, MAR398, courseworks**
C8	Take notes effectively	**Induction Programme**
C9	Use computational tools and packages	**CSC601, MAR104, MAR201, MAR206, MAR207, MAR212, MAR312, MAR301, MAR302, MAR303, MAR304,** *MAR333*, *ENM308, ENM309, ENM319* **MAR398,** *ENG401*, **MAR499,** *MAR805, MAR806*
C10	Produce a conceptual or elemental design to a specification	**MAR103, MAR206, MAR207, MAR212, MAR301, MAR302, MAR303, MAR304, MAR398**
C11	Search for information to develop concepts	**MAR101, MAR103, MAR301, MAR302, MAR303, MAR304, MAR398, MAR499 & courseworks**
D1	Communicate effectively (in writing, verbally and through drawings)	**MAR101, MAR103**, *MAR325,* **MAR301, MAR302, MAR303, MAR304, MAR398, MAR499 & courseworks**
D2	Apply mathematical skills (algebra, geometry, modelling, analysis)	**EEE136, MMM151/124, EEE235, MMM251, CIV221, MAR101, MAR103, MAR201, MAR202, MAR203, MAR206, MAR207, MAR208, MAR210, MAR213, MAR209, MAR211**, **MAR301, MAR302, MAR303, MAR304**, **MAR311, MAR312, MAR313, MAR315, MAR316, MAR 318, MAR319,** *MAR321, MAR322,* **MAR324**, *MAR325*, **MAR326**, MAR327, **MAR328, MAR329, MAR398, MAR499** & *relevant electives*
D3	Work as a member of a team (E)	**MAR212, MAR301, MAR499**
D4	Use Information and Communications Technology	**MAR104, MAR301, MAR302, MAR303, MAR304, MAR398, MAR499**
D5	Manage resources and time	BUS310, **MAR301, MAR302, MAR303, MAR304, MAR398, MAR499 & courseworks**
D6	Learn independently in familiar and unfamiliar situations with open-mindedness and in the spirit of critical enquiry	**MAR301, MAR302, MAR303, MAR304, MAR398, MAR499**
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:

Admission offers normally conform to the UK Engineering Council "SARTOR" minimum requirements for MEng. and BEng with Chartered Engineer status, i.e. UK GCE A-level grades BBB and CCC respectively (both including Mathematics) for Stage 1 admission. In addition, the University recruits candidates with a wide range of equivalent qualifications based on its knowledge of SARTOR equivalents and other international qualifications. A limited number of international qualifications and HND holders with appropriate subjects and grades may be considered for direct entry to Stage 2, and in exceptional cases direct entry to Stage 3 will be considered.

Engineering requires a wide range of attributes and abilities, so selection is not solely based on academic grades. Selectors seek evidence of motivation and commitment from the Personal Statement and Reference on UCAS forms and applicants are encouraged to attend for interview whenever possible.

Notwithstanding adherence to SARTOR standards, the School is committed to widening access, particularly for "late developers". Links exist with the Engineering Access Course at Newcastle College and there is a Faculty Foundation Year (Stage 0) for those with insufficient science and mathematics to enter Stage 1 directly. Limited numbers of places may be available to Regional candidates through the University's "Partners Programme". All UCAS forms, including Late or Summer applications are considered, but the School does not normally take candidates through Clearing.

The first two years of B.Eng. and MEng. are essentially common and any candidate passing Stage 2 "with Merit" may enter Stage 3 MEng..

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 l 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 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-sessional 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.

14 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 under Reserved Business, in the absence of the student representatives. The Board responds to these reports through Faculty Teaching and Learning Committee.

Accreditation reports

This programme is accredited by:

- Institute of Marine Engineering, Science and Technology (IMarEST)
- Royal Institution of Naval Architects (RINA)

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.

Feedback mechanisms
Feedback to students is effected 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 programme, see http://www.ncl.ac.uk/internal/academic-quality/qualityhome.htm#2.

Committees with responsibilities for quality and standards

- University Teaching Committee
- Faculty Teaching Committee
- Faculty Policy & Resources Committee (for resource issues)
- Board of Studies
- School's Teaching Committee
- School's Executive Board (for resource issues)
- School's Staff/Student Committee
- Board of Examiners
- Mechanisms for student feedback
- Student representation on Board of Studies
- University Staff/Student Committee
- Student representation on University Teaching Committee
- Fortnightly Stage meeting (Stage 1&2)
- Personal Tutors

Staff Development activities

- All new staff complete Certificate in Learning & Teaching
- Professional Development Review linked to staff development

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). In summary, students must pass 120 credits at each Stage. Limited compensation down to 35 is possible at each

Stage and there are resit opportunities, with certain restrictions.

Weighting of Stages
Modules taken at Stages 2 and 3 are Honours modules and the two stages contribute to the award of the final degree in the ratio 25:750.

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

The following mark classification will be used for the assessment of most examinations and courseworks. However, there will be occasions when the assessment requirements of the module (or piece of assessed work) require an alternative classification. In these circumstances, other clear criteria will be used, in conjunction with the aims and objectives of the module (or piece of assessed work)

Class Equivalent	**Mark Range**	**Descriptive Equivalent**
First Class	90-100	Excellent. An outstanding piece of work throughout with excellent analysis, synthesis and evaluation of material and concise, logical thought. Where appropriate, work shows originality and critical ability. Demonstrates comprehensive understanding of topic with evidence of substantial additional study and with virtually no errors. Extremely well presented and structured work. Could not be bettered at this Stage in the time available.
	80-89	Excellent. Outstanding in most elements but minor deficiencies in some, compensated by excellence in others. Extremely well presented and structured work.
	70-79	Excellent. Work overall excellent with respect to synthesis, originality, critical ability and logical argument. Thorough understanding of the topic and evidence of significant additional study, although may contain minor errors. Extremely well presented and structured work.
Upper Second Class	65-69	Very good. Shows thorough understanding of topic. Substantial detail supported by reasoned argument, application and critical analysis, with evidence of further study. Very well presented and structured work.
	60-64	Very good. Work provides substantial information that addresses the aims and objectives of the module/topic. May contain minor errors of understanding. Some evidence of additional study. Very well presented and structured work.
Lower Second Class	55-59	Good. Work indicates understanding of the topic, largely factually correct, but lacking in critical analysis and in evidence of further study. May contain significant errors of understanding compensated by very good work in other areas. Well presented and structured.

	50-54	Good. Work that is relevant to the module/topic aims and objectives but not a full treatment. Relies almost entirely on course material and may contain significant errors of understanding and some errors of fact. Generally well presented and adequately structured.
Third Class	45-49	Basic. Limited but acceptable understanding of material. Omission of much relevant material and/or use of irrelevant material. May contain significant errors of understanding and fact. Adequately structured and presented.
	40-44	Basic. Barely acceptable with limited grasp of material. Significant omissions, errors of understanding and factual errors. Generally poorly presented and structured.
Fail Compensation Range	35-39	Borderline fail. Demonstrates minimum acceptable understanding in some though not all areas. Many factual errors and omissions. Generally poorly presented and structured.
Fail	30-34	Fail. Some material of relevance, but generally irrelevant approach and failure to understand basic requirements of module/topic. Significant factual errors and omissions. Little or no structure and poorly presented.
	16-29	Fail. Limited work showing an inability to deal with the requirements of the module/topic.Some factually relevant material.
	6-15	Fail. Extremely limited work with very little factually relevant material.
	0-5	Fail. Little or no attempt to complete the work.

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 June Board 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:

This programme was accredited in 2003 by:

- Institute of Marine Engineering, Science and Technology (IMarEST)
- Royal Institution of Naval Architects (RINA)

Accreditation is for student intake cohorts from 2003 to 2007.

Internal Review Reports

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 are as follows:

- The methods by which research is promoted and clearly developed and progressed throughout the School's programmes.
- The manner in which the School had taken steps to surmount progression and retention issues.
- 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. The Faculty is commended for its new large teaching laboratory in the Ridley Building.
- Liaison by the School librarian with the academics within the School.
- The support staff for their role within the School.
- The special and collaborative provision within the School, with regard to its innovative nature, the method in which it is managed, the clear rationale that has been developed for the provision, the support which exists for it and its teaching and learning strategy.

Previous QAA Reports

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 Prospectus (see http://www.ncl.ac.uk/undergraduate/subjects/xxx)

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