PROGRAMME QUALITY HANDBOOK 2025-26

HNC Marine Engineering

1. Welcome and Introduction to HNC Marine Engineering

Welcome to HNC Marine Engineering delivered at Kings Road Campus by City College Plymouth.

No environment on Earth is as demanding as the sea. Designing and building vessels and structures that can withstand the wind, waves and salt exposure requires special education and experience. The modern world's global commerce is largely enabled by the ocean-going technological marvels created by Marine Engineers. This programme has been designed to give the student a broad knowledge of marine engineering, covering essential engineering topics such as mathematics, engineering science and materials, as well as essential managerial knowledge and design methodologies. Students will embark on several design projects throughout the course where they will be able to use Computer Aided Design along with other industry based software to showcase their new found knowledge and skills. A work based element is introduced into the course through the Management and design modules where employed part time students will be able to use incorporate work based projects set by their employers and Full time students will have both the chance of placements or industry set work based projects. Throughout the course many of the module's assessments have been arranged to gain essential knowledge that will carry through to other modules. A wide range of assessments have been adopted to ensure student engagement including practical based assessments, reports, exams, portfolios and presentations.

This programme has been designed to equip you with the skills and knowledge base required to work in your chosen specialism or other graduate opportunities. It is also a platform from which you can undertake additional vocational and academic qualifications.

This Programme Quality handbook contains important information including:
The approved programme specification
Module records

Note: The information in this handbook should be read in conjunction with the current edition of:

- Your Programme Institution & University Student Handbook which contains student support based information on issues such as finance and studying at HE
    - available in your Google Classroom
- Your Module, Teaching, Learning and Assessment Guide
    - available in your Google Classroom
    -
- Plymouth University's Student Handbook

- available at: https://www.plymouth.ac.uk/your-university/governance/student-handbook

HNC Marine Engineering

Final award title **HNC Marine Engineering**

Level X Intermediate award title(s) **N/A**

Level X Intermediate award title(s) **N/A**

UCAS code N/A

JACS code J610

Awarding Institution: University of Plymouth

Teaching institution(s): City College Plymouth

1. Accrediting body(ies)

The course is not currently accredited however the intention is to apply for accreditation once we have our first round of graduates in Sept 2019.
The intention is to apply for accreditation of EngTec status through RINA and IMAREst.

2. Distinctive Features of the Programme and the Student Experience

This programme will develop a base knowledge of Marine Engineering theory as well as essential skills required in the field of Marine Engineering. Students will carry out practical design projects using proven theory to solve engineering problems.
Throughout many of the course's modules, you will use a range of industry standard software. This will be supplemented by practical activities to allow for evaluation of industry standard design.
Some modules will be delivered within specialist workshop/ laboratory areas.
Marine Engineering is an exciting and varied sector; Marine Engineers can be responsible for the design, construction and maintenance of sea going vessels or structures within the marine environment. This HNC programme has been designed to develop your skills and knowledge within core subjects related to Marine Engineering such as Mathematics, Science and Materials. Along with these essential subjects included are topics covering the Managerial aspects of Marine Engineering, Naval Architecture and a Computer Aided Design Project. A HNC is an industry recognised qualification which could lead to further study within Higher Education or indeed a promotion within an existing place of work. Delivery of this programme will be at our Kings Road Campus utilising the engineering facilities and the new STEM centre.

3. Relevant QAA Subject Benchmark Group(s)

The subject benchmark statement (2015)[1] defines the academic standard expected of graduates with an engineering degree. The defined learning outcomes are those published by the Engineering Council in the UK-SPEC UK standard for professional engineering competence www.engc.co.uk Third edition[2], the QAA Quality Code[3] and the SEEC Higher Education Level Discriptors[4]

1. http://www.qaa.ac.uk/en/Publications/Documents/SBS-engineering-15.pdf
2. http://www.engc.org.uk/engcdocuments/internet/Website/UK-SPEC%20third%20edition%20(1).pdf
3. http://www.qaa.ac.uk/AssuringStandardsAndQuality/quality-code/Pages/default.aspx
4. http://www.seec.org.uk/wp-content/uploads/2016/07/SEEC-descriptors-2016.pdf

4. Programme Structure

The Programme of study comprises of 120 module credits across level 4. The aim of the programme is too develop skills consistent with Engineering Council and Engineering Subject Benchmarks. Due to our strong links with employers in the city and high number of part time learners who are already employed in industry our programme has been developed to provide for the varied roles across the city as Engineers, as well as provide a solid grounding to our students wishing to further their study.

8. Programme Structure for the HNC in Marine Engineering (part-time) New Programme Structure
2025-26

Year 1				Year 2			
Module Code	**Module Title**	**No. of Credits**	**Core / Optional**	**Module Code**	**Module Title**	**No. of Credits**	**Core / Optional**
CITY1077	Engineering Mathematics	20	Core	CITY1093	Naval Architecture	20	Core
CITY1078	Engineering Science 1	20	Core	CITY1094	Management Techniques in Marine Engineering	20	Core
CITY1091	Engineering Materials	20	Core				
CITY1092	CAD Techniques & Design	20	Core				

All Modules are delivered All Year unless stated otherwise

5. Programme Aims

This programme aims to:

1. Develop engineering knowledge and understanding to apply technical and practical skills.
2. Provide an opportunity to ‘contribute towards design’ via practical and project based work.
3. Provide an opportunity for ‘accepting and exercising personal responsibility.’
4. Provide an opportunity to use effective communication and interpersonal skills.

6. Programme Intended Learning Outcomes

Programme ILOs have been adapted from UK-SPEC
UK STANDARD FOR PROFESSIONAL
ENGINEERING COMPETENCE
Engineering Technician
www.engc.org.uk
Third edition

8.1. Knowledge and understanding

On successful completion graduates should have developed:

1) The ability to review and select appropriate techniques, procedures and methods to undertake tasks.
2) The ability to use appropriate scientific, technical or engineering principles.

8.2. Cognitive and intellectual skills

On successful completion graduates should have developed:

1) The ability to identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions.
2) The ability to identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact.

8.3. Key and transferable skills

On successful completion graduates should have developed the ability to:

1) Use oral, written and electronic methods for the communication of technical and other information.

8.4. Employment related skills

On successful completion graduates should have developed:

1) Good student centred learning skills which will promote lifelong learning and a commitment to continuing professional development to achieve flexibility within the work environment.

8.5. Practical skills

On successful completion graduates should have developed:

1) Undertake engineering work in a way that contributes to sustainable development.

9. Admissions Criteria, including APCL, APEL and DAS arrangements

All applicants must have GCSE (or equivalent) Maths and English at Grade C or above or Grade 4 and above on the new grading structure.

Entry Requirements for HNC Marine Engineering	
A-level/AS-level	Normal minimum entry requirements are 48 on new UCAS Tariff at A-level to include Grade D in Maths or Physics
BTEC National Diploma/QCF Extended Diploma	Candidates are interviewed before an offer is made. But an equivalent of 48 UCAS points in an Engineering Subject
Access to Higher Education at level 3	Candidates are interviewed before an offer is made. Pass an Access to HE Diploma in Science with an equivalent of 48 UCAS points
Welsh Baccalaureate	Normal minimum entry requirements are an equivalent of 48 on new UCAS Tariff include Maths, Physics or Engineering
Scottish Qualifications Authority	Normal minimum entry requirements are an equivalent of 48 on new UCAS Tariff include Maths, Physics or Engineering
Irish Leaving Certificate	Normal minimum entry requirements are an equivalent of 48 on new UCAS Tariff include Maths, Physics or Engineering
International Baccalaureate	Normal minimum entry requirements are an equivalent of 48 on new UCAS Tariff include Maths, Physics or Engineering

Non Standard Qualifications with experience	All non-standard applicants are interviewed by the tutor and screened centrally to ensure impartial oversight.

10. Progression criteria for Final and Intermediate Awards

Students who successfully complete the HNC may progress to:

- City College Plymouth's FdSc Marine Engineering or FdSc Naval Architecture.
- Plymouth University's BSc Marine & Composites year 2
- Plymouth University's BEng Marine Tech year 1 (Students must score above 60% overall & 60% in maths)

11. Exceptions to Regulations

N/A

12. Transitional Arrangements

The College is currently delivering both an HNC and FdSc Marine Engineering. It is planned that all students currently enrolled on these programmes will transfer to the new Programme. Transitional Arrangements to ensure all learning outcomes are met are listed below. Students will have all previous relevant module grades APCL'd. All existing students have been consulted to the transitional arrangement and have signed a consent form.

Part time first years will need to study CITY1092 CAD Techniques and Design in 2017 /2018 instead of CITY1094 Management Techniques in Marine Engineering in their second year.

All new students from September 2017 will enrol on the new structure.

13. Mapping and Appendices:

13.1. ILO's against Modules Mapping

Please see appendix 13.1

13.2. Assessment against Modules Mapping

Please see appendix 13.2

13.3. Skills against Modules Mapping

Please see appendix 13.3

Appendix 13.1 – Learning Outcomes map

	LEVEL 4			
FHEQ Descriptors	Subject Benchmark(s)	Programme Aims	Programme Outcomes	Core Modules linked to outcomes
Students will have demonstrated: Knowledge of the underlying concepts and principles associated with their areas of study;	A Use engineering knowledge and understanding to apply technical and practical skills.	1. Develop engineering knowledge and understanding to apply technical and practical skills.	8.1.1) The ability to review and select appropriate techniques, procedures and methods to undertake tasks. 8.1.2) The ability to use appropriate scientific, technical or engineering principles.	CITY1077, CITY1078, CITY1091, CITY1092, CITY1093, CITY1094.
Ability to evaluate and interpret these within the context of that area of study;	B) Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems or services.	1. Develop engineering knowledge and understanding to apply technical and practical skills. 2. Provide an opportunity to 'contribute towards design' via practical and project based work.	8.1.1) The ability to review and select appropriate techniques, procedures and methods to undertake tasks. 8.1.2) The ability to use appropriate scientific, technical or engineering principles. 8.2.1) The ability to identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions. 8.2.2) The ability to identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact.	CITY1077, CITY1078, CITY1091, CITY1092, CITY1093, CITY1094.

	LEVEL 4			
FHEQ Descriptors	Subject Benchmark(s)	Programme Aims	Programme Outcomes	Core Modules linked to outcomes
Ability to present, evaluate and interpret qualitative and quantitative data;	D) Use effective communication and interpersonal skills.	1. Develop engineering knowledge and understanding to apply technical and practical skills. 4. Provide an opportunity to use effective communication and interpersonal skills.	8.2.2) The ability to identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact. 8.3.1) Use oral, written and electronic methods for the communication of technical and other information.	CITY1077, CITY1078, CITY1091, CITY1093.
Students will be able to: Evaluate the appropriateness of different approaches to solving problems related to their area of study;	A) Use engineering knowledge and understanding to apply technical and practical skills. B) Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems or services.	1. Develop engineering knowledge and understanding to apply technical and practical skills. 2. Provide an opportunity to 'contribute towards design' via practical and project based work. 3. Provide an opportunity for 'accepting and exercising personal responsibility.' 4. Provide an opportunity to use effective communication and interpersonal skills.	8.1.1) The ability to review and select appropriate techniques, procedures and methods to undertake tasks. 8.1.2) The ability to use appropriate scientific, technical or engineering principles. 8.2.1) The ability to identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions. 8.2.2) The ability to identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact.	CITY1077, CITY1078, CITY1091, CITY1093.
Communicate the results of their study accurately and reliably and with structured and coherent argument	D) Use effective communication and interpersonal skills.	4. Provide an opportunity to use effective communication and interpersonal skills.	8.3.1) Communicate ideas and information; through verbal and written forms using	CITY1078, CITY1091, CITY1092, CITY1093, CITY1094.

	LEVEL 4			
FHEQ Descriptors	Subject Benchmark(s)	Programme Aims	Programme Outcomes	Core Modules linked to outcomes
			appropriate terminology and presentation of data.	
Undertake further training and develop new skills within a structured and managed environment	E) Make a personal commitment to an appropriate code of professional conduct, recognising obligations to society, the profession and the environment.	3. Provide an opportunity for 'accepting and exercising personal responsibility.'	8.4.1) Good student centred learning skills which will promote lifelong learning and a commitment to continuing professional development to achieve flexibility within the work environment.	CITY1077, CITY1078, CITY1091, CITY1092, CITY1093, CITY1094.
Students will also have: The qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility	C) Accept and exercise personal responsibility.	2. Provide an opportunity to 'contribute towards design' via practical and project based work. 3. Provide an opportunity for 'accepting and exercising personal responsibility.'	8.4.1) Good student centred learning skills which will promote lifelong learning and a commitment to continuing professional development to achieve flexibility within the work environment. 8.5.1) Undertake engineering work in a way that contributes to sustainable development.	CITY1077, CITY1078, CITY1091, CITY1092, CITY1093, CITY1094.

Appendix 13.2 Assessment against modules Map

	CITY1077 Engineering Mathematics (Core)	CITY1078 Engineering Science 1 (Core)	CITY1091 Engineering Materials (Core)	CITY1092 CAD Techniques and Design (Core)	CITY1093 Naval Architecture (Core)	CITY1094 Management Techniques in Marine Engineering (Core)
Essay			✔			
Report		✔	✔			✔
Engineering Problem Assignment	✔					
Portfolio				✔		
Exam	✔	✔				
In Class Test					✔	
Practical					✔	
Presentation						✔

Appendix 13.3 Skills against modules Map

	CITY1077 Engineering Mathematics (Core)	CITY1078 Engineering Science 1 (Core)	CITY1091 Engineering Materials (Core)	CITY1092 CAD Techniques and Design (Core)	CITY1093 Naval Architecture (Core)	CITY1094 Management Techniques in Industry (Core)
Essay Writing			✔			
Report Writing			✔	✔		✔
Project Planning / Management						
Research		✔			✔	
IT Skills			✔	✔	✔	✔
Team Work					✔	
Evaluation	✔	✔			✔	✔
Data Analysis	✔	✔	✔	✔	✔	✔

1. Module Records

<u>SECTION A: DEFINITIVE MODULE RECORD</u>. Proposed changes must be submitted via Faculty Quality Procedures for approval and issue of new module code.

MODULE CODE: **CITY1077**	**MODULE TITLE**: **Engineering Mathematics**

CREDITS: **20**	**FHEQ LEVEL**: **4**	**JACS CODE**: **G160**

PRE-REQUISITES: N	**CO-REQUISITES: N**	**COMPENSATABLE: Y**

SHORT MODULE DESCRIPTOR:
To develop the student's mathematical ability and to apply principles to the solution of engineering problems and to make use of mathematical computer based packages.

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ELEMENTS OF ASSESSMENT					
WRITTEN EXAMINATION		**COURSEWORK**		**PRACTICE**	
E1 (Formally scheduled)	50%	**C1**	50%	**P1**	
E2 (OSCE)		**C2**		**P3**	
T1 (in-class test)		**A1**			

SUBJECT ASSESSMENT PANEL: Technology

Professional body minimum pass mark requirement: n/a

MODULE AIMS:

- To gain a solid foundation in algebra, trigonometry, functions and calculus in order to associate and recognise the importance of mathematics in the analysis of engineering problems
- To develop mathematical problem solving simultaneously with other science and engineering modules.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of a module the learner **will be expected to be able to:**

LO1. recognise the essential application of mathematical techniques to solve engineering problems
LO2. apply exact mathematical methods to analyse and solve problems of an engineering and scientific nature
LO3. use complex number theory in practical engineering applications
LO4. understand a variety of techniques of differential and integral calculus and their associated applications in engineering

DATE OF APPROVAL: May 2017	**FACULTY/OFFICE: Academic Partnerships**
DATE OF IMPLEMENTATION: Sept 2017	**SCHOOL/PARTNER: City College Plymouth**

DATE(S) OF APPROVED CHANGE:	TERM: All Year

Additional notes (for office use only):

Additional Guidance for Learning Outcomes:
To ensure that the module is pitched at the right level check your intended learning outcomes against the following nationally agreed standards

- Framework for Higher Education Qualifications

http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/FHEQ08.pdf

- Subject benchmark statements
  http://www.qaa.ac.uk/ASSURINGSTANDARDSANDQUALITY/SUBJECT-GUIDANCE/Pages/Subject-benchmark-statements.aspx

- SEEC level descriptors
  http://www.seec.org.uk/academic-credit/seec-credit-level-descriptors-2010 (scroll to pdf link at bottom of page)

- Professional, regulatory and statutory (PSRB) accreditation requirements (where necessary e.g. health and social care, medicine, engineering, psychology, architecture, teaching, law)

- QAA Quality Code
  http://www.qaa.ac.uk/AssuringStandardsAndQuality/quality-code/Pages/default.aspx

- **SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT**

Items in this section must be considered annually and amended as appropriate, in conjunction with the Module Review Process. Some parts of this page may be used in the KIS return and published on the extranet as a guide for prospective students. Further details for current students should be provided in module guidance notes.

ACADEMIC YEAR: 2025/26	**NATIONAL COST CENTRE: 122**

MODULE LEADER: Owais Raja	**OTHER MODULE STAFF: N/A**

Summary of Module Content

Revision of Algebra and Arithmetic

Basic number and arithmetic operations, algebraic techniques including evaluation of formula, rearranging formula, solving simple equations, laws of logarithms, laws of indices, etc. These skills will be built upon throughout the delivery of each individual topic in this module.

Trigonometric functions and graphs

Simple trigonometric functions of sine, cosine, tangent and hyperbolic functions of $\sinh^{-1}$, $\cosh^{-1}$ and $\tanh^{-1}$. The applications of these functions in engineering including vectors and waveform combination.

Complex numbers

Addition, subtraction, multiplication and division of complex numbers in Polar and Cartesian form. The Argand diagram. The modulus and argument. Applications in engineering.

Differential Calculus

Basic differentiation techniques of polynomial, trigonometric, exponential and logarithmic functions. Further techniques including the product, quotient and chain rules. Engineering applications to optimisation and higher order differentials.

Integral calculus

Basic integration techniques of polynomial, trigonometric and exponential functions. Further techniques including integration by parts and substitution. The methodical applications of definite and indefinite integration with and without engineering scenarios including the interpretation of areas under a curve.

SUMMARY OF TEACHING AND LEARNING		
Scheduled Activities	**Hours**	Comments/Additional Information
Lecture	60	30 x 2 hour lectures
Tutorial	15	Group and individual academic tutorials
Independent Study	125	Guided self-study
Total	**200**	

Category	***Element***	***Component Name***	***Component weighting***	***Comments*** *Include links to learning objectives*
Written exam	E1	End of Module Examination	100%	LO1-4 (Covering topics not assessed in coursework)
	T_			
Coursework	C1	Assignment	100%	LO1-4
Practice	P_		N/A	

Updated by: Owais Raja Date: August 2025	**Approved by** Hollie Galpin-Mitchell Date: August 2025

Recommended Texts and Sources

The recommended texts for the course are:

Kuldeep Singh (2011) Engineering Mathematics Through Applications [Paperback] Palgrave Macmillan; 2nd edition edition

Stroud, K.A. and Booth, D.J. (2013) *Engineering mathematics*. 7th edn. Basingstoke: Palgrave Macmillan.

Stroud, K.A. and Booth, D.J. (2011) *Advanced engineering mathematics*. 5th edn. Basingstoke: Palgrave Macmillan.

Bird, J. (2014) Basic engineering mathematics. 6th edn. London: Routledge.

Bird, J. (2017) Higher engineering mathematics. 7th edn. United Kingdom: Routledge.

Greater Manchester University (no date) Available at: http://www.cse.salford.ac.uk/physics/gsmcdonald/PPLATO.php

SECTION A: DEFINITIVE MODULE RECORD. ***Proposed changes must be submitted via Faculty Quality Procedures for approval and issue of new module code.***

MODULE CODE: CITY1078	MODULE TITLE: Engineering Science 1

CREDITS: 20	FHEQ LEVEL: 4	JACS CODE: H100

PRE-REQUISITES: N	CO-REQUISITES: N	COMPENSATABLE: Y

SHORT MODULE DESCRIPTOR:

An introduction to mechanical principles, energy transfer and AC electrical theory. Mechanical principles including solid mechanics, statics, dynamics and mechanical vibrations. Modes of heat transfer and energy losses. Electrical principles and single phase AC theory.

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ELEMENTS OF ASSESSMENT					
WRITTEN EXAMINATION		COURSEWORK		PRACTICE	
E1 (Formally scheduled)	50%	**C1**	50%	**P1**	
E2 (OSCE)		**C2**		**P3**	
T1 (in-class test)		**A1**			

SUBJECT ASSESSMENT PANEL: Technology

Professional body minimum pass mark requirement: n/a

MODULE AIMS:

- To investigate the fundamental scientific principles which underpin the design and operation of engineering systems.
- To give a mechanical and electrical overview which will provide the basis for further study in specialist areas of engineering.

ASSESSED LEARNING OUTCOMES: (additional guidance below)

At the end of a module the learner **will be expected to be able to:**

LO1. Demonstrate an understanding of basic static and dynamic mechanical systems
LO2. Investigate energy transfer in thermal and fluid systems
LO3. Recognise and recall how DC theory relates to simple electrical machines
LO4. Show knowledge and awareness of the fundamental principles of single phase AC theory

DATE OF APPROVAL: May 2017	**FACULTY/OFFICE: Academic Partnerships**
DATE OF IMPLEMENTATION: Sept 2017	**SCHOOL/PARTNER: CCP**
DATE(S) OF APPROVED CHANGE:	**TERM: All Year**

Additional notes (for office use only):

Additional Guidance for Learning Outcomes:

To ensure that the module is pitched at the right level check your intended learning outcomes against the following nationally agreed standards

- Framework for Higher Education Qualifications http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/FHEQ08.pdf
- Subject benchmark statements http://www.qaa.ac.uk/ASSURINGSTANDARDSANDQUALITY/SUBJECT-GUIDANCE/Pages/Subject-benchmark-statements.aspx
- SEEC level descriptors http://www.seec.org.uk/academic-credit/seec-credit-level-descriptors-2010 (scroll to pdf link at bottom of page)
- Professional, regulatory and statutory (PSRB) accreditation requirements (where necessary e.g. health and social care, medicine, engineering, psychology, architecture, teaching, law)
- QAA Quality Code http://www.qaa.ac.uk/AssuringStandardsAndQuality/quality-code/Pages/default.aspx

- **SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT**

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ACADEMIC YEAR: 2025/26	**NATIONAL COST CENTRE: 114**

MODULE LEADER: Mayowa Adio	**OTHER MODULE STAFF:**

Summary of Module Content

Statics and Dynamics: SF and BM, bending stresses. Torsion . Uniform acceleration linear and angular. Newton's laws of motion, mass moment of inertia, kinetic energy, effects of friction. Vibrations, SHM, forcing and damping. Energy Transfer: Heat transfer: conduction, convection, radiation, thermal conductivity, forced convection, black and grey body radiation. insulated surfaces. Viscosity: boundary layer formation, laminar and turbulent flow, pressure loss in pipes. Energy losses: dynamic viscosity, power loss in bearings. pipe friction losses.
Electrical Principles: Conductors, insulators, voltage and current. Ohm's law, Kirchhoff''s law. Power: Electro-magnetic induction, transformers, Lenz's and Faraday's laws. Generator and motor principles. Single Phase AC theory: Non-resonant circuits: R-C-L circuits; Argand diagrams. Resonant circuits, L-C series and parallel, resonant frequency, Power factor correction, Complex waveforms: graphical analysis, odd and even-harmonics, phase shift, non-linear characteristics.

SUMMARY OF TEACHING AND LEARNING		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture / Lab time	60	30 x 2hr sessions
Tutorial	15	30 x 1hr
Independent Study	125	A mixture of guided study and self-study.
Total	**200**	

Category	***Element***	***Component Name***	***Component weighting***	***Comments*** *Include links to learning objectives*
Written exam	E_	End of Module Examination	100%	LO1, LO2
	T_	In Class Test		
Coursework	C_	Assignment *(Report on in class experiments)*	100%	LO3, LO4
Practice	P_		N/A	

Updated by: Mayowa Adio Date: August 2025	**Approved by**: Hollie Galpin-Mitchell Date:August 2025

The recommended texts for the course are:

Bolton, W. (2004) Higher engineering science. 2nd edn. Amsterdam, [Pays-Bas]: Newnes (an imprint of Butterworth-Heinemann Ltd).

Tooley, M.H., Dingle, L., BA, M.T. and Technol.., A. (2012) Engineering science: For foundation degree and higher national. New York: Elsevier Science.

Bacon, D H and Stephens, R C (2000) Mechanical technology, Industrial Press, New York

SECTION A: DEFINITIVE MODULE RECORD. ***Proposed changes must be submitted via Faculty Quality Procedures for approval and issue of new module code.***

MODULE CODE: CITY1091	**MODULE TITLE: Engineering Materials**

CREDITS: 20	**FHEQ LEVEL: 4**	**JACS CODE: J500**

PRE-REQUISITES: **None**	**CO-REQUISITES:** **None**	**COMPENSATABLE:** **Yes**

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
Study of Material structure. Appreciation of material properties. Understanding of manufacturing and design considerations for the use of different materials.

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ELEMENTS OF ASSESSMENT ***[Use HESA KIS definitions}***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICE	
E1 (Formally scheduled)		**C1**	100%	**P1**	
E2 (OSCE)		**C2**		**P3**	
T1 (in-class test)		**A1**			

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Technology

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To develop students' understanding and knowledge of basic manufacturing and materials technology, enabling them to appreciate why an understanding of the relationships between processing, structure, and properties is a key element in engineering.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:

LO1. Understand the effects of material structure on material properties.
LO2. Appreciate the effect of material choice on manufacturing procedures.
LO3. Describe the effects of processing on structure and properties of engineering materials.
LO4. Carry out tensile testing and interpret the results.

DATE OF APPROVAL: May 2017	**Academic Partnerships**
DATE OF IMPLEMENTATION: September 2017	**City College Plymouth**
DATE(S) OF APPROVED CHANGE:	**TERM: All year**

Additional notes (for office use only):

Additional Guidance for Learning Outcomes:

To ensure that the module is pitched at the right level check your intended learning outcomes against the following nationally agreed standards

- Framework for Higher Education Qualifications http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/FHEQ08.pdf
- Subject benchmark statements http://www.qaa.ac.uk/ASSURINGSTANDARDSANDQUALITY/SUBJECT-GUIDANCE/Pages/Subject-benchmark-statements.aspx
- SEEC level descriptors http://www.seec.org.uk/academic-credit/seec-credit-level-descriptors-2010 (scroll to pdf link at bottom of page)
- Professional, regulatory and statutory (PSRB) accreditation requirements (where necessary e.g. health and social care, medicine, engineering, psychology, architecture, teaching, law)
- QAA Quality Code http://www.qaa.ac.uk/AssuringStandardsAndQuality/quality-code/Pages/default.aspx

- **SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT**

Items in this section must be considered annually and amended as appropriate, in conjunction with the Module Review Process. Some parts of this page may be used in the KIS return and published on the extranet as a guide for prospective students. Further details for current students should be provided in module guidance notes.

ACADEMIC YEAR: 2025/26	**NATIONAL COST CENTRE: 117**

MODULE LEADER: Mayowa Adio	**OTHER MODULE STAFF:**

Summary of Module Content

Shaping processes (solidification processes): mechanics, engineering analysis and practice of metal casting, and plastic moulding.
Shaping processes (bulk deformation processes): mechanics, engineering analysis and practice of rolling, forging, extrusion, bar and wire drawing
Basic engineering metrology including measuring instruments and gauges for linear and angular dimensions, Investigate the feasibility of replacing metal with composite substitutes, Investigate the properties of different composite structures and layup processes.
Properties of materials. Interpretation of stress-strain curves.
Practical measurement of mechanical properties.
Qualitative description of major differences between generic classes of materials in terms of their microstructure. Influence of atomic bonding on properties. Cast structures and defects in metals. Types of polymers and additives. Polymer glass transition temperature and melting point.
Property modification techniques; relationship between structure, processing, heat treatment, and properties. Metals: plastic deformation; hot and cold working; micro defects and their influence. Polymers: drawing and moulding; directionality of properties; influence of strain rate. Alloying: use of phase equilibrium diagrams in heat treatment; types of alloy. Properties, structure, and uses of the plain carbon steels and the major non-ferrous alloys.

SUMMARY OF TEACHING AND LEARNING *[Use HESA KIS definitions}*		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	26	26x1hr lectures
Supported Study	16	16x1hr supported engineering problems and lab reporting
Workshop activities	10	Hands on practical activities
Directed Independent Study	20	Identified independent study
Self-Study	105	Coursework and individual reading
Lab Session	8	4x2hr lab sessions
Tutorial	15	A mix of individual and group tutorials
Total	**200**	**(NB: 1 credit = 10 hours of learning; 10 credits = 100 hours, etc)**

Category	***Element***	***Component Name***	***Component weighting***	***Comments*** *Include links to learning objectives*
Written exam	E1			
	T1			
Coursework	C1	Lab report Essay	50% 50%	LO1, LO2 LO3, LO4
Practice	P1			

Updated by: Mayowa Adio Date: August 2025	**Approved by**: Hollie Galpin-Mitchell Date: August 2025

Essential Reading List;

Askeland, D and Phule, P (2002) *The science and engineering of materials*, Thomson Learning, London

Ashby, M, F. and Johns D,R,H. (2005) *Engineering Materials 1; An introduction to Properties, Applications and Design 3rd ed.,* Elsevier,
Oxford.

De Graff, M and McHenry, M,E. (2007) *Structure of Materials; An introduction to crystallography, Diffraction, and Symmetry,* Cambridge University Press, Cambridge.

Bolton, W (2002) *Technology of engineering materials*, Elsevier, Oxford

Ashby, M,F. (2005) *Materials Selection and Mechanical Design 3rd Ed.* Elsevier, Oxford.

Web sites
www.azom.com
www.SME.com

SECTION A: DEFINITIVE MODULE RECORD*. Proposed changes must be submitted via Faculty Quality Procedures for approval and issue of new module code.*

MODULE CODE: CITY 1092	**MODULE TITLE:** CAD Techniques and Design

CREDITS: 20	**FHEQ LEVEL:4**	**JACS CODE: H130**

PRE-REQUISITES: None	**CO-REQUISITES:** None	**COMPENSATABLE:** **Yes**

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
An Introduction into CAD in the Design Process, progressing swiftly through 2D draughting to explore 3D conceptual design and visualisation. During this module students will take part in a relevant work based design project.

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ELEMENTS OF ASSESSMENT ***[Use HESA KIS definitions}***

WRITTEN EXAMINATION		COURSEWORK		PRACTICE	
E1 (Formally scheduled)		**C1**	100%	**P1**	
E2 (OSCE)		**C2**		**P3**	
T1 (in-class test)		**A1**			

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Technology

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
- Investigation of how formal draughting forms a corner stone of the design process
- Practice of the skills necessary to produce and interpret drawings and computer models to British Standards
- Experimentation in to the use of 3D visualisation as an engineering tool
- Introduce Design techniques and carry out a work based design project.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
LO1. Produce 2D detail and assembly drawings and 3D wireframe, surface and solid models using an industry standard CAD package to British Standards.
LO2. Produce rendered and animated visualisations to present to employers
LO3. Formulate, implement, evaluate and present a work based design project
LO4. Report to employers on the sustainability and ecology in design and the product life cycle

DATE OF APPROVAL: May 2017	**Academic Partnerships**
DATE OF IMPLEMENTATION: Sept 2017	**City College Plymouth**

DATE(S) OF APPROVED CHANGE:	TERM: All year

Additional notes (for office use only):

Additional Guidance for Learning Outcomes:

To ensure that the module is pitched at the right level check your intended learning outcomes against the following nationally agreed standards

- Framework for Higher Education Qualifications http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/FHEQ08.pdf
- Subject benchmark statements http://www.qaa.ac.uk/ASSURINGSTANDARDSANDQUALITY/SUBJECT-GUIDANCE/Pages/Subject-benchmark-statements.aspx
- SEEC level descriptors http://www.seec.org.uk/academic-credit/seec-credit-level-descriptors-2010 (scroll to pdf link at bottom of page)
- Professional, regulatory and statutory (PSRB) accreditation requirements (where necessary e.g. health and social care, medicine, engineering, psychology, architecture, teaching, law)
- QAA Quality Code http://www.qaa.ac.uk/AssuringStandardsAndQuality/quality-code/Pages/default.aspx

- **SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT**

Items in this section must be considered annually and amended as appropriate, in conjunction with the Module Review Process. Some parts of this page may be used in the KIS return and published on the extranet as a guide for prospective students. Further details for current students should be provided in module guidance notes.

ACADEMIC YEAR: 2025/26	**NATIONAL COST CENTRE: 143**

MODULE LEADER: Martin Boulter	**OTHER MODULE STAFF:**

Summary of Module Content

CAD & Drawings in the design process
Drawing standards and formats
The use of 2D CAD drawing and editing commands
Conceptual Design and 3D CAD
3D Wireframe, Surface and Solid Modelling commands
3D Visualisation
Sustainability and ecology in design and the product life cycle.
Material and process selection tools. Functionality, component simulation (free body diagrams, etc.) Design calculation tools - spread sheets. The design process - specifying, creating and evaluating ideas, developing and documenting. Working in a team. System design - team working.

SUMMARY OF TEACHING AND LEARNING *[Use HESA KIS definitions}*		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	20	10 x 2 hr lectures
Practical Sessions	40	Application of techniques and methods learnt
Tutorial	15	A mixture of group and personal tutorials
Directed Independent Study	125	Working in groups and independently on their Projects
Total	**200**	**(NB: 1 credit = 10 hours of learning; 10 credits = 100 hours, etc)**

Category	***Element***	***Component Name***	***Component weighting***	***Comments*** *Include links to learning objectives*
Written exam	E1			
	T1			
Coursework	C1	**Portfolio of Evidence Report**	100%	LO1, LO2, LO3 LO4
Practice	P1			

Essential Reading List;

BS8888: 2013 Technical product documentation specification (31 December 2013), London: British Standards Institute

PP8888-1:2007 A guide for schools and colleges to BS 8888:2006, Technical Product Specification (06 September 2007), London: British Standards Institute

Yarwood, Alf (2013) Introduction to AutoCAD 2013 2D & 3D Design, Oxford: Elsevier

McFarlane, B (2004) Modelling with AutoCAD 2004, Elsevier, Oxford

McFarlane, B (2001) *Advancing with AutoCAD 2000,* Elsevier, Oxford

Simmons, C and Maguire, D (2004) *Manual of engineering drawing: to British and International standards,* Elsevier, Oxford

Holtzapple, M, T. and Reece, W,D. (2008) *Concepts in Engineering 2nd Ed.,*McGraw Hill, New York.

SECTION A: DEFINITIVE MODULE RECORD*. Proposed changes must be submitted via Faculty Quality Procedures for approval and issue of new module code.*

MODULE CODE: CITY 1093	**MODULE TITLE: Naval Architecture**

CREDITS: 20	**FHEQ LEVEL: 4**	**JACS CODE: H500**

PRE-REQUISITES: None	**CO-REQUISITES:** None	**COMPENSATABLE:** **Yes**

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
The module introduces the theory of ship stability and the interaction between a vessel, its cargo and counteracting the effects

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ELEMENTS OF ASSESSMENT *[Use HESA KIS definitions}*					
WRITTEN EXAMINATION		COURSEWORK		PRACTICE	
E1 (Formally scheduled)		**C1**		**P1**	30%
E2 (OSCE)		**C2**		**P3**	
T1 (in-class test)	70%	**A1**			

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Technology

Professional body minimum pass mark requirement: N/A

MODULE AIMS:

- To stimulate and widen the student's knowledge of Naval Architecture
- To provide the student with the knowledge and abilities to research the effects of ship stability to safely operate.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:

LO5. Explain and calculate trim and stability at small and large angles of heel.
LO6. Analyse and calculate the effects of flooding on a ships trim and stability including countermeasures
LO7. Explain the principles of dry docking and slipping
LO8. Demonstrate the theory and practical application of a ship inclining experiment

DATE OF APPROVAL: 10 May 2017	**Academic Partnerships**
DATE OF IMPLEMENTATION: September 2017	**City College Plymouth**
DATE(S) OF APPROVED CHANGE:	**TERM: All year**

Additional notes (for office use only):

Additional Guidance for Learning Outcomes:

To ensure that the module is pitched at the right level check your intended learning outcomes against the following nationally agreed standards

- Framework for Higher Education Qualifications http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/FHEQ08.pdf
- Subject benchmark statements http://www.qaa.ac.uk/ASSURINGSTANDARDSANDQUALITY/SUBJECT-GUIDANCE/Pages/Subject-benchmark-statements.aspx
- SEEC level descriptors http://www.seec.org.uk/academic-credit/seec-credit-level-descriptors-2010 (scroll to pdf link at bottom of page)
- Professional, regulatory and statutory (PSRB) accreditation requirements (where necessary e.g. health and social care, medicine, engineering, psychology, architecture, teaching, law)
- QAA Quality Code http://www.qaa.ac.uk/AssuringStandardsAndQuality/quality-code/Pages/default.aspx

- **SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT**

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ACADEMIC YEAR: 2025/26	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Martin Boulter	**OTHER MODULE STAFF:**

Summary of Module Content
Ship stability terminology, distribution of volume, weight and buoyancy and associated coefficients, the use of data and calculations to identify a ships stability, changes of trim longitudinal and transversely due to loading and unloading. Calculate changes in draft and trim due to bilging and compartment flooding and the effect on a vessels stability
The theory of dry docking and slipping and the standard practices, the theory and practical applications of the inclining experiment and the associated calculations

SUMMARY OF TEACHING AND LEARNING ***[Use HESA KIS definitions}***		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	60	30 x 2hr Lectures
Tutorial	15	a mix of group and individual tutorials
Directed Independent Study	35	Research tasks
Self-Study	80	Assignment and reading
Workshop time	10	
Total	**200**	**(NB: 1 credit = 10 hours of learning; 10 credits = 100 hours, etc)**

Category	***Element***	***Component Name***	***Component weighting***	***Comments*** *Include links to learning objectives*
Written exam	E1			
	T1	Open book test	100%	LO1; LO2; LO3
Coursework	C1			
Practice	P1	LAB	100%	LO4

Updated by:Martin Boulter Date: August 2025	**Approved by**: Hollie Galpin-Mitchell Date: August 2025

Essential Reading List;
Derrett, D R and Barrass, B (2012) *Ship stability for masters and mates*, Elsevier, Oxford, 7th edition

Rawson, K J and Tupper, E C (2001) *Basic ship theory: combined volume*, Elsevier, Oxford
Barrass, B (2001) *Ship stability: notes and examples*, Elsevier, Oxford
Tupper, E C (2013) *Introduction to naval architecture*, Elsevier, Oxford, 5 Edition

SECTION A: DEFINITIVE MODULE RECORD*. Proposed changes must be submitted via Faculty Quality Procedures for approval and issue of new module code.*

MODULE CODE: CITY1094	MODULE TITLE: Management Techniques in Marine Engineering

CREDITS: 20	FHEQ LEVEL: 4	JACS CODE: N210

PRE-REQUISITES: None	CO-REQUISITES: None	COMPENSATABLE: Yes

SHORT MODULE DESCRIPTOR: On completion of this unit to appraise the main techniques that improve organisations' operations.

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ELEMENTS OF ASSESSMENT *[Use HESA KIS definitions}*

WRITTEN EXAMINATION		COURSEWORK		PRACTICE	
E1 (Formally scheduled)		**C1**	60%	**P1**	40%
E2 (OSCE)		**C2**		**P3**	
T1 (in-class test)		**A1**			

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Technology

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
Students will be able to explain how application of management techniques can improve the plans, designs, processes or systems for the optimisation of operational activity within an organisation and throughout the supply chain.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
LO1 – Discuss contemporary management techniques used to improve and optimise operational activity, including the associated supply chains, within the field of marine engineering
LO2 – Apply financial analysis and planning control methods to marine engineering scenarios.
LO3 – Analyse the role of modern quality and performance management methods for delivering service excellence and value to the customer.
LO4 – Investigate the management challenges presented within the field of marine engineering as a result of increasing competitiveness, globalisation and environmental issues.

LO5 – Evaluate and communicate lean enterprise concepts applied to the marine engineering sector.

DATE OF APPROVAL: May 2017	**Academic Partnerships**
DATE OF IMPLEMENTATION September 2017	**City College Plymouth**
DATE(S) OF APPROVED CHANGE:	**TERM: All Year**

Additional notes (for office use only):

Additional Guidance for Learning Outcomes:

To ensure that the module is pitched at the right level check your intended learning outcomes against the following nationally agreed standards

- Framework for Higher Education Qualifications
  http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/FHEQ08.pdf
- Subject benchmark statements
  http://www.qaa.ac.uk/ASSURINGSTANDARDSANDQUALITY/SUBJECT-GUIDANCE/Pages/Subject-benchmark-statements.aspx
- SEEC level descriptors
  http://www.seec.org.uk/academic-credit/seec-credit-level-descriptors-2010 (scroll to pdf link at bottom of page)
- Professional, regulatory and statutory (PSRB) accreditation requirements (where necessary e.g. health and social care, medicine, engineering, psychology, architecture, teaching, law)
- QAA Quality Code
  http://www.qaa.ac.uk/AssuringStandardsAndQuality/quality-code/Pages/default.aspx

- **SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT**

Items in this section must be considered annually and amended as appropriate, in conjunction with the Module Review Process. Some parts of this page may be used in the KIS return and published on the extranet as a guide for prospective students. Further details for current students should be provided in module guidance notes.

ACADEMIC YEAR: 2025/26	**NATIONAL COST CENTRE: 133**

MODULE LEADER: Mayowa Adio	**OTHER MODULE STAFF:**

Summary of Module Content
Operations management functions; input-transformation-output model; operations management within corporate strategic framework; functional relationship of operations management; challenges facing operations management – globalisation, environmental issues, knowledge management, technology; key performance objectives; design process; differing processes; process technologies; job design; work measurement; quality control; facility location; operations planning & control – scheduling, forecasting demand, JIT; project management; TQM.

SUMMARY OF TEACHING AND LEARNING *[Use HESA KIS definitions}*		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lectures	30	30 x 1hr lectures
Seminars	30	30 x 1hr seminars
Self study	120	Reading, research, Sim Venture activities
External Visit	3	Visit to manufacturer production line
External Speakers	4	2 guest lectures
Tutorials	13	Group and individual tutorials
Total	**200**	

Category	***Element***	***Component Name***	***Component weighting***	***Comments*** *Include links to learning objectives*
Written exam	E			
	T			
Coursework	C	Report	100%	LO1, LO2, LO3
Practice	P	Presentation	100%	LO4, LO5

Updated by: Mayowa Adio Date: August 2025	**Approved by**: Hollie Galpin-Mitchell Date: August 2025

Core Text

Slack N, Brandon-Jones A & Johnston R (2016) *Operations Management* 8th Edn
Harlow: Pearson Education

Supplementary Texts and Websites

Greasley A (2013) *Operations Management* 3rd Edn
Chichester: Wiley

Slack N, Brandon-Jones A, Johnston R & Betts A (2015) *Operations and Process Management* 4th Edn
Harlow: Pearson Education

Daily Telegraph website

BBC News (Business) website

Journal

International Journal of Operations and Production Management