PROGRAMME QUALITY HANDBOOK 2025-26

FdSc Marine Engineering

1. Welcome and Introduction to FdSc Marine Engineering 3
2. Programme Specification 4
3. Module Records 28

1. Welcome and Introduction to Fdsc Marine Engineering

Welcome to FdSc 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
- University of plymouth's Student Handbook
  - available at: https://www.plymouth.ac.uk/your-university/governance/student-handbook

1. Programme Specification

Final award title **FdSc Marine Engineering**

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

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

UCAS code J602

JACS code J610

Awarding Institution: University of Plymouth

Teaching institution(s): City College Plymouth

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 partial accreditation of IEng status through RINA and IMAREst.

Distinctive Features of the Programme and the Student Experience

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.

Relevant QAA Subject Benchmark Group(s)

The subject benchmark statement for Engineering (2015)[1] defines the academic standard expected of graduates with an engineering degree. The Characteristics Statement for Foundation Degrees (September 2015)[2] describes the distinctive features of a Foundation Degree delivered in the UK. In conjunction with the two statements listed above, the programme aims and programme intended learning outcomes have been created with the Engineering Council in the UK-SPEC UK standard for professional engineering competence www.engc.co.uk Third edition 3, the QAA Quality Code[4] and the SEEC Level Descriptors(2010)[5] in mind.

1. http://www.qaa.ac.uk/en/Publications/Documents/SBS-engineering-15.pdf
2. http://www.qaa.ac.uk/en/Publications/Documents/Foundation-Degree-Characteristics-15.pdf
3. http://www.engc.org.uk/engcdocuments/internet/Website/UK-SPEC%20third%20edition%20(1).pdf
4. http://www.qaa.ac.uk/AssuringStandardsAndQuality/quality-code/Pages/default.aspx
5. https://www.plymouth.ac.uk/uploads/production/document/path/2/2544/SEEC_Level_Descriptors_2010_0.pdf

Programme Structure

The Programme of study comprises of 240 module credits across level 4 and level 5 with 120 credits per level. 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 full time students wishing to further their study or enter employment.

Programme Structure for the Foundation Degree in Marine Engineering (full-time) (6253) 2025-2025

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	CITY2092	Engineering Science 2	20	Core
CITY1078	Engineering Science 1	20	Core	CITY2093	Advanced CAD & FEA	20	Core
CITY1091	Engineering Materials	20	Core	CITY2094	Engineering Design	20	Core
CITY1092	CAD Techniques & Design	20	Core	CITY2095	Composite Materials for the Marine Environment	20	Core
CITY1093	Naval Architecture	20	Core	CITY2096	Engine Technology and Marine Propulsion Systems	20	Core
CITY1094	Management Techniques in Marine Engineering	20	Core	CITY2097	Project	20	Core

All Modules are delivered All Year unless stated otherwise

Programme Structure for the Foundation Degree Marine Engineering (part-time) (6254) 2025-26

Year 1				Year 2				Year 3			
Module Code	**Module Title**	**No. of Credits**	**C / O**	**Module Code**	**Module Title**	**No. of Credits**	**C / O**	**Module Code**	**Module Title**	**No. of Credits**	**C / O**
CITY 1077	Engineering Mathematics	20	C	CITY 1093	Naval Architecture	20	C	CITY 2094	Engineering Design	20	C
CITY 1078	Engineering Science 1	20	C	CITY 1094	Management Techniques in Marine Engineering	20	C	CITY 2095	Composite Materials for the Marine Environment	20	C
CITY 1091	Engineering Materials	20	C	CITY 2092	Engineering Science 2	20	C	CITY 2096	Engine Technology and Marine Propulsion Systems	20	C
CITY 1092	CAD Techniques & Design	20	C	CITY 2093	Advanced CAD & FEA	20	C	CITY 2097	Project	20	C

C = Core Module

All Modules are delivered All Year unless stated otherwise

Programme Aims

This programme aims to:

1. Establish broad foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles to the analysis and design of marine engineering systems.
2. Provide the opportunity to 'learn through design' via practical and project based work, particularly within the context of marine engineering design.
3. Provide an awareness of the business implications of engineering decisions and a knowledge of the inter-relationship between the market, engineering activities and the management structures
4. Provide the opportunity to develop communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills.

Programme Intended Learning Outcomes

8.1. Knowledge and understanding

On successful completion graduates should have developed:

1) A sound theoretical approach to the application of technology in marine engineering practice.
2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Marine Engineering Sector.
3) A sound evidence-based approach to problem-solving and contribute to continuous improvement.

8.2. Cognitive and intellectual skills

On successful completion graduates should have developed:

1) The ability to Identify, review and select techniques, procedures and methods to undertake marine engineering tasks.
2) The ability to use results of analysis to solve marine engineering problems, apply technology and implement solutions.
3) The ability to Implement design solutions and contribute to their evaluation through projects focused upon the Marine Engineering Industry.

8.3. Key and transferable skills

On successful completion graduates should have developed the ability to:

1) Communicate ideas and information; through verbal and written forms using appropriate terminology and presentation of data.
2) Work independently or as a member of a team.

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.
2) The ability to liaise with employers through work based design projects.

8.5. Practical skills

On successful completion graduates should have developed:

1) The ability to select and use appropriate equipment to perform engineering tasks.
2) The ability to monitor, analyse and evaluate marine engineering systems.

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 FdSc Marine Engineering (6253/6254)	
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.

Level 5 entry:
Students may enter at level 5 with a relevant HNC and 120 module credits subject to being APCL'd PU Regulations Apply.

9. Progression criteria for Final and Intermediate Awards

Students, who successfully complete the FdSc may progress to:

- City College Plymouth's BSc Integrated Technologies Engineering Stage 3 (with 60% overall)
- University of Plymouth's BEng Marine Technology Stage 2 (with 60% Level 5 Aggregate)
- Plymouth University's BEng Marine Technology (Top Up going to Level 6)

10. Exceptions to Regulations

Through application the college has been granted exception to regulations to allow part time students to APCL 120 level 4 credits and a further 40 credits at level 5 into year 3 of FdSc Marine Engineering if they have passed the HNC and studied a further 40 credits of level 5 modules as a short course during their part time year 2 of study. The two level 5 modules will be :
CITY2092 Engineering Science 2 and CITY 2093 Advanced CAD and FEA

11. 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.
Existing Full time students will move to the new stage 2 without any problems. 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, and the standard part time third year in 2020/2021.
Part time second years will need to study CITY2093 Advanced CAD and FEA in 2020/2021 instead of Project.
All new students from September 2017 will enrol on the new structure.

12. Mapping and Appendices:

12.1. ILO's against Modules Mapping

Please see appendix 13.1

12.2. Assessment against Modules Mapping

Please see appendix 13.2

12.3. Skills against Modules Mapping

Please see appendix 13.3

13.4 Work Based Learning Mapping

Please see appendix 13.4

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;	A2, Use appropriate scientific, technical or engineering principles.	1. Establish broad foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles to the analysis and design of engineering systems.	8.1.1) A sound theoretical approach to the application of technology in marine engineering practice. 8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Marine Engineering Sector. 8.2.1) The ability to Identify, review and select techniques, procedures and methods to undertake marine engineering tasks.	CITY1077, CITY1078, CITY1091, CITY1092, CITY1093, CITY1094.
Ability to evaluate and interpret these within the context of that area of study;	A1, Review and select appropriate techniques, procedures and methods to undertake tasks. B1, Identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions. B2, Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact. D1, Use oral, written and electronic methods for	1. Establish broad foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles to the analysis and design of engineering systems. 2. Provide the opportunity to ‘learn through design’ via practical and project based work, particularly within the context of marine engineering design. 4. Provide the opportunity to develop communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills.	8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Marine Engineering Sector. 8.1.3) A sound evidence-based approach to problem-solving and contribute to continuous improvement. 8.2.2) The ability to use results of analysis to solve marine engineering problems, apply technology and implement solutions.	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;	the communication in English1 of technical and other information.	4. Provide the opportunity to develop communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills.	8.4.2) The ability to liaise with employers through work based design projects. 8.2.2) The ability to use results of analysis to solve marine engineering problems, apply technology and implement solutions. 8.3.1) Communicate ideas and information; through verbal and written forms using appropriate terminology and presentation of data.	CITY1077, CITY1078, CITY1091, CITY1093.
Students will be able to: Evaluate the appropriateness of different approaches to solving problems related to their area of study;	A1, Review and select appropriate techniques, procedures and methods to undertake tasks. A2, Use appropriate scientific, technical or engineering principles. B1, Identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions.	4. Provide the opportunity to develop communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills.	8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Marine Engineering Sector. 8.1.3) A sound evidence-based approach to problem-solving and contribute to continuous improvement. 8.2.2) The ability to use results of analysis to solve marine engineering problems, apply technology and implement solutions. 8.2.3) The ability to Implement design solutions and contribute to their evaluation through projects	CITY1077, CITY1078, CITY1091, CITY1093.

	LEVEL 4			
FHEQ Descriptors	Subject Benchmark(s)	Programme Aims	Programme Outcomes	Core Modules linked to outcomes
			focused upon the Marine Engineering Industry.	
Communicate the results of their study accurately and reliably and with structured and coherent argument	D1, Use oral, written and electronic methods for the communication in English1 of technical and other information.	4. Provide the opportunity to develop communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills.	8.3.1) Communicate ideas and information; through verbal and written forms using appropriate terminology and presentation of data. 8.4.2.) The ability to liaise with employers through work based design projects.	CITY1078, CITY1091, CITY1092, CITY1093, CITY1094.
Undertake further training and develop new skills within a structured and managed environment	E4, Carry out and record CPD necessary to maintain and enhance competence in own area of practice including: • Undertake reviews of own development needs • Plan how to meet personal and organisational objectives • Carry out planned (and unplanned) CPD activities • Maintain evidence of competence development • Evaluate CPD outcomes against any plans made • Assist others with their own CPD.	1. Establish broad foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles to the analysis and design of engineering structures. 2. Provide the opportunity to 'learn through design' via practical and project based work, particularly within the context of marine engineering design. 3. Provide an awareness of the business implications of engineering decisions and a knowledge of the inter-relationship between the market, engineering activities and the management structures.	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.

	LEVEL 4			
FHEQ Descriptors	Subject Benchmark(s)	Programme Aims	Programme Outcomes	Core Modules linked to outcomes
		4. Provide the opportunity to develop communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills.		
Students will also have: The qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility	C1, Work reliably and effectively without close supervision, to the appropriate codes of practice. E1, Comply with the Code of Conduct of your institution. E2, Manage and apply safe systems of work.	1. Establish broad foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles to the analysis and design of engineering structures. 3. Provide an awareness of the business implications of engineering decisions and a knowledge of the inter-relationship between the market, engineering activities and the management structures. 4. Provide the opportunity to develop communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills.	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. 8.4.2) The ability to liaise with employers through work based design projects.	CITY1077, CITY1078, CITY1091, CITY1092, CITY1093, CITY1094.

	LEVEL 5			
FHEQ Descriptors	Subject Benchmark(s)	Programme Aims	Programme Outcomes	Core Modules linked to outcomes
Students will have demonstrated: Knowledge and critical understanding of the well-established principles of their area of study and the way in which those principles have developed;	A1, Maintain and extend a sound theoretical approach to the application of technology in engineering practice. B2, Contribute to the design and development of engineering solutions. B3, Implement design solutions and contribute to their evaluation.	1. Establish broad foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles to the analysis and design of engineering systems. 2. Provide the opportunity to 'learn through design' via practical and project based work, particularly within the context of marine engineering design.	8.1.1) A sound theoretical approach to the application of technology in marine engineering practice. 8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Marine Engineering Sector. 8.1.3) A sound evidence-based approach to problem-solving and contribute to continuous improvement.	CITY2092, CITY2093, CITY2094, CITY2095, CITY2096, CITY2097.
Ability to apply underlying concepts and principles outside the context in which they were first studied, including where appropriate, the application of those principles in an employment context;	A2, Use a sound evidence-based approach to problem-solving and contribute to continuous improvement. B1, Identify, review and select techniques, procedures and methods to undertake engineering tasks. B2, Contribute to the design and development of engineering solutions.	1. Establish broad foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles to the analysis and design of engineering systems. 2. Provide the opportunity to 'learn through design' via practical and project based work, particularly within the context of marine engineering design. 4. Provide the opportunity to develop	8.1.3) A sound evidence-based approach to problem-solving and contribute to continuous improvement. 8.2.1) The ability to Identify, review and select techniques, procedures and methods to undertake marine engineering tasks. 8.2.2) The ability to use results of analysis to solve marine engineering problems, apply technology and implement solutions.	CITY2092, CITY2093, CITY2094, CITY2095, CITY2096, CITY2097.

	LEVEL 5			
FHEQ Descriptors	Subject Benchmark(s)	Programme Aims	Programme Outcomes	Core Modules linked to outcomes
Knowledge of the main methods of enquiry in the subject relevant to the named award, and ability to evaluate critically the appropriateness of different approaches to solving problems in the field of study;	B3, Implement design solutions and contribute to their evaluation. A1, Maintain and extend a sound theoretical approach to the application of technology in engineering practice. A2, Use a sound evidence-based approach to problem-solving and contribute to continuous improvement. B2, Contribute to the design and development of engineering solutions.	communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills. 1. Establish broad foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles to the analysis and design of engineering systems. 2. Provide the opportunity to 'learn through design' via practical and project based work, particularly within the context of marine engineering design. 4. Provide the opportunity to develop communication, data collection and analysis,	8.3.1) Communicate ideas and information; through verbal and written forms using appropriate terminology and presentation of data. 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. 8.4.2) The ability to liaise with employers through work based design projects. 8.5.1) The ability to select and use appropriate equipment to perform engineering tasks. 8.5.2) The ability to monitor, analyse and evaluate marine engineering systems. 8.1.3) A sound evidence-based approach to problem-solving and contribute to continuous improvement. 8.2.1) The ability to Identify, review and select techniques, procedures and methods to undertake marine engineering tasks. 8.2.2) The ability to use results of analysis to solve marine engineering problems, apply technology and implement solutions.	CITY2092, CITY2093, CITY2094, CITY2095, CITY2096, CITY2097.

	LEVEL 5			
FHEQ Descriptors	Subject Benchmark(s)	Programme Aims	Programme Outcomes	Core Modules linked to outcomes
An understanding of the limits of the knowledge, and how this influences analyses and interpretations based on that knowledge	B3, Implement design solutions and contribute to their evaluation. C1, Plan for effective project implementation. A2, Use a sound evidence-based approach to problem-solving and contribute to continuous improvement.	ingenuity, problem solving, application and diagnostic skills. 1. Establish broad foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles to the analysis and design of engineering systems. 4. Provide the opportunity to develop communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills.	8.2.3) The ability to Implement design solutions and contribute to their evaluation through projects focused upon the Marine Engineering Industry. 8.4.2.) The ability to liaise with employers through work based design projects. 8.5.1) The ability to select and use appropriate equipment to perform engineering tasks. 8.5.2) The ability to monitor, analyse and evaluate engineering systems. 8.1.1) A sound theoretical approach to the application of technology in marine engineering practice. 8.1.3) A sound evidence-based approach to problem-solving and contribute to continuous improvement. 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.	CITY2092, CITY2093, CITY2094, CITY2095, CITY2096, CITY2097.
Students will be able to:				

	LEVEL 5			
FHEQ Descriptors	Subject Benchmark(s)	Programme Aims	Programme Outcomes	Core Modules linked to outcomes
Use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis;	A2, Use a sound evidence-based approach to problem-solving and contribute to continuous improvement. B1, Identify, review and select techniques, procedures and methods to undertake engineering tasks. B3, Implement design solutions and contribute to their evaluation.	1. Establish broad foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles to the analysis and design of engineering systems. 4. Provide the opportunity to develop communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills.	8.1.1) A sound theoretical approach to the application of technology in marine engineering practice. 8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Marine Engineering Sector. 8.1.3) A sound evidence-based approach to problem-solving and contribute to continuous improvement. 8.2.1) The ability to Identify, review and select techniques, procedures and methods to undertake marine engineering tasks. 8.2.2) The ability to use results of analysis to solve marine engineering problems, apply technology and implement solutions. 8.2.3) The ability to Implement design solutions and contribute to their evaluation through projects focused upon the Marine Engineering Industry. 8.5.1) The ability to select and use appropriate equipment to perform engineering tasks. 8.5.2) The ability to monitor, analyse and evaluate engineering systems.	CITY2092, CITY2094, CITY2095, CITY2096.

	LEVEL 5			
FHEQ Descriptors	Subject Benchmark(s)	Programme Aims	Programme Outcomes	Core Modules linked to outcomes
Effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences, and deploy key techniques of the discipline effectively;	D1, Communicate in English2 with others at all levels. D2, Present and discuss proposals. D3, Demonstrate personal and social skills.	4. Provide the opportunity to develop communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills.	8.3.1) Communicate ideas and information; through verbal and written forms using appropriate terminology and presentation of data. 8.4.2) The ability to liaise with employers through work based design projects.	CITY2094, CITY2097.
Undertake further training, develop existing skills and acquire new competences that will enable them to assume significant responsibility within organisations.	E4, Carry out and record CPD necessary to maintain and enhance competence in own area of practice.	1. Establish broad foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles to the analysis and design of engineering structures. 2. Provide the opportunity to 'learn through design' via practical and project based work, particularly within the context of marine engineering design.	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. 8.4.2) The ability to liaise with employers through work based design projects.	CITY2092, CITY2093, CITY2094, CITY2095, CITY2096, CITY2097.
Students will also have: The qualities and transferable skills necessary for employment requiring the exercise of personal responsibility and decision-making	E4, Carry out and record CPD necessary to maintain and enhance competence in own area of practice. E5, Exercise responsibilities in an ethical manner.	1. Establish broad foundation knowledge on which to develop further skills as technology advances and to enable students to apply engineering principles to the analysis and design of engineering structures. 2. Provide the opportunity to 'learn through design' via practical and	8.1.1) A sound theoretical approach to the application of technology in marine engineering practice. 8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Marine Engineering Sector.	CITY2092, CITY2093, CITY2094, CITY2095, CITY2096, CITY2097.

	LEVEL 5			
FHEQ Descriptors	Subject Benchmark(s)	Programme Aims	Programme Outcomes	Core Modules linked to outcomes
		project based work, particularly within the context of marine engineering design. 3. Provide an awareness of the business implications of engineering decisions and a knowledge of the inter-relationship between the market, engineering activities and the management structures. 4. Provide the opportunity to develop communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills.	8.1.3) A sound evidence-based approach to problem-solving and contribute to continuous improvement. 8.2.1) The ability to Identify, review and select techniques, procedures and methods to undertake marine engineering tasks. 8.2.2) The ability to use results of analysis to solve marine engineering problems, apply technology and implement solutions. 8.2.3) The ability to Implement design solutions and contribute to their evaluation through projects focused upon the Marine Engineering Industry. 8.3.1) Communicate ideas and information; through verbal and written forms using appropriate terminology and presentation of data. 8.3.2) Work independently or as a member of a team. 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. 8.4.2) The ability to liaise with employers through work based design projects.	

	LEVEL 5			
FHEQ Descriptors	Subject Benchmark(s)	Programme Aims	Programme Outcomes	Core Modules linked to outcomes
			8.5.1) The ability to select and use appropriate equipment to perform engineering tasks. 8.5.2) The ability to monitor, analyse and evaluate marine engineering systems.	

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)	CITY 2092 Engineering Science 2 (Core)	CITY2093 Advanced CAD and FEA (Core)	CITY2094 Engineering Design (Core)	CITY2095 Composite Materials for the Marine Environment (Core)	CITY 2096 Engine Technology and Marine Propulsion Systems (Core)	CITY2097 Project (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 Marine Engineering (Core)	CITY 2092 Engineering Science 2 (Core)	CITY2093 Advanced CAD and FEA (Core)	CITY2094 Engineering Design (Core)	CITY2095 Composite Materials for the Marine Environment (Core)	CITY 2096 Engine Technology and Marine Propulsion Systems (Core)	CITY2097 Project (Core)
Essay Writing			✔									
Report Writing			✔	✔	✔	✔			✔	✔		✔
Project Planning / Management					✔				✔	✔		✔
Research		✔			✔	✔			✔	✔		✔
IT Skills			✔	✔	✔	✔		✔	✔		✔	✔
Team Work					✔				✔		✔	✔
Evaluation	✔	✔			✔	✔	✔		✔	✔	✔	✔
Data Analysis	✔	✔	✔	✔	✔				✔	✔	✔	✔

Appendix 13.4 Work Based Learning Map

FHEQ level: 5				
WBL Activity	**Prog Intended LO**	**Related Modules**	**Assessed LO**	**Range of Assessments**
Work based Design Projects	8.1.1) A sound theoretical approach to the application of technology in marine engineering practice. 8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Marine Engineering Sector. 8.1.3) A sound evidence-based approach to problem-solving and contribute to continuous improvement. 8.2.3) The ability to Implement design solutions and contribute to their evaluation through projects focused upon the Marine Engineering Industry. 8.3.1) Communicate ideas and information; through verbal and written forms using appropriate terminology and presentation of data. 8.3.2) Work independently or as a member of a team.	CITY1092 Cad Techniques and Design CITY2097 Project	**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 **LO1.** Present and agree specifications and project planning **LO2.** Implement the project within agreed procedures and to specification. **LO3.** Evaluate the project **LO4**. Present a project evaluation.	Portfolio of Evidence Report to employers Portfolio Presentation to Employers

Visit to Teignbridge Propeller Manufacturer And Guest lecture	8.4.2) The ability to liaise with employers through work based design 8.5.2) The ability to monitor, analyse and evaluate marine engineering systems._____ _____ 8.1.1) A sound theoretical approach to the application of technology in marine engineering practice. 8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Marine Engineering Sector. 8.2.3) The ability to Implement design solutions and contribute to their evaluation through projects focused upon the Marine Engineering Industry. 8.3.1) Communicate ideas and information; through verbal and written forms using appropriate terminology and presentation of data. 8.5.2) The ability to monitor, analyse and evaluate marine engineering systems.	CITY2096 Engine Technology and Marine Propulsion Systems	LO3. Assess transmission systems and justify applications to different types of vessels. LO4. Apply Propeller design theory to individual 3d Propeller projects and justify its design to peers through seminars	Assessed Seminar

An explanation of this map:

Teaching Learning and Assessment are being aligned to embed Work Based Learning for both Full and Part Time Learners. All students will be addressed by an employer to present the engineering problem for the CAD Techniques and Design module CITY1092. The Employer will then be part of the assessment of the finished designs. All Students in the Project CITY2097 will present their projects to a range of employers during the presentation day. Teignbridge Propeller manufacturer has agreed to conduct a work based visit to show the students all aspects of Propeller design, prior to students participating in a propeller design project prior to their final assessment of Engine Technology and Marine Propulsion Systems CITY2096.

2. Module Records

SECTION A: DEFINITIVE MODULE RECORD. 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.

.

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.

.

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**

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: 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.

.

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.

.

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

.

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**

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: 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.

.

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

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

MODULE CODE: CITY2092	**MODULE TITLE: Engineering Science 2**

CREDITS: 20	**FHEQ LEVEL: 5**	**JACS CODE: H140**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module will enhance the knowledge acquired in engineering science, looking at more in depth methods of analysis of solids, statics and dynamics in the field of engineering.

.

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

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

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To provide the knowledge and understanding to make informed choice when selecting materials for design and manufacture

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

LO9. Investigate the effects of stress and strain on solid bodies.
LO10. Analyse structures, stress, strain and deflection in 2d and 3d bodies.
LO11. Analyse rotational dynamics, balancing and simple harmonic motion.
LO12. Be able to solve a range of engineering problems.

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: 114**

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

Summary of Module Content

Complex loading systems: Poisson's Ratio, two and three dimensional loading systems, volumetric strain. Elastic constants, Relationships. Loaded beams and cylinders:
Slope and deflection of beams, Flexure equation. Simply supported, cantilever, propped beams, concentrated and point loads and couples, Macaulay's Method. Thin walled cylinders;
Factor of Safety, Joint stresses. Thick walled cylinders; Auto-frettage. Stress distribution. Balancing of simple and multi-plane rotating mass systems. Out of balance Flywheels .

SUMMARY OF TEACHING AND LEARNING *[Use HESA KIS definitions}*		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	28	28 x 1hr lectures
Supported Problem solving	28	28 x 1hr supported sessions
Academic Support	15	A mix of group and individual tutorial time
Directed Independent Study	20	Identified independent study prior to seminars
Self-Study	105	Coursework and individual reading
Lab time	4	2 x 2hr Science Lab investigations
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	In Class Test	100%	LO3, LO4
Coursework	C1	Engineering Problem Assignment	100%	LO1, LO2

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

Essential Reading List;

Darbyshire, A. (2010) *Mechanical Engineering*. Elsevier, Oxford

Bird, J. and Ross, C. (2014) *Mechanical Engineering Principles 3rd Ed.* Routledge, London.

Rattan, S,S. (2009)*Theory of Machines 3rd Ed. Tata McGraw Hill, New Delhi.*

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

MODULE CODE: CITY2093	MODULE TITLE: Advanced CAD & FEA

CREDITS: 20	FHEQ LEVEL: 5	JACS CODE: H130

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
The development of 3D modelling techniques, Surface and Solid modelling within a dedicated 3D modelling package. Creating 3D visualisation and animations to communicate design concepts. Produce full sets of drawings, BOM's and manufacturing information. Analyse the stresses and strains on structures using FEA techniques to achieve an optimised design solution.

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 provide the knowledge and understanding of the use of 3d modelling software in the use of design and analyse materials and structures for design.

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

LO13. Use computer software to produce complex 3D models of engineering components.
LO14. Analyse structures, stress strain and deflections using FEA techniques.
LO15. Produce engineering drawings, BOMs and Manufacturing information to international standards.
LO16. Apply tolerances; surface finish, dimensional and geometrical to engineering components.

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: 143**

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

Summary of Module Content

Design a solution to an engineering problem; produce a 3D Solid model using the appropriate software, and perform structural analysis using FEA techniques.
Produce to international standards Drawings, BOM's and Manufacturing information.
Produce a report detailing all design considerations, the design process and outcomes.

SUMMARY OF TEACHING AND LEARNING ***[Use HESA KIS definitions}***		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	20	10 x 2hr lectures
Guided Study	40	20 x 2hr sessions hands on Inventor time in CAD lab
Tutorial	15	A mix of group and individual tutorial time
Self-Study	125	Project work and individual reading
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	100%	LO13, LO14, LO15, LO16
Practice	P1			

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

Essential Reading List;

Recommended Reference Literature

Waguespack, Curtis et al (2008) *Mastering Autodesk Inventor 2013 and Autodesk Inventor LT2013*, Indianapolis, Wiley Publishing.

Additional Learning Resources

For **FREE** Autodesk programmes to download to your own PC go to:
http://students.autodesk.com/

FREE Student Autodesk Software, go to:
http://students.autodesk.com/
or
http://students.autodesk.com/?nd=download_center

AUTODESK INVENTOR ESSENTIALS VIDEOS
http://wikihelp.autodesk.com/Inventor/enu/2013/Help/0107-Essentia107#Topics_in_this_section

CAD FILE MANAGEMENT - CREATE A PROJECT FOLDER
http://wikihelp.autodesk.com/Inventor/enu/2013/Help/3877-CAD_Mana3877/3890-Configur3890

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

MODULE CODE: CITY2094	**MODULE TITLE: Engineering Design**

CREDITS: 20	**FHEQ LEVEL: 5**	**JACS CODE: H150**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
The aim of this module is to give students an opportunity to experience the process of carrying out a design project from conception to implementation.
It will enable them to appreciate that design involves all aspects of customer desire, marketing, project planning, costing, product design and manufacture.

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

WRITTEN EXAMINATION		COURSEWORK		PRACTICE	
E1 (Formally scheduled)		**C1**	80%	**P1**	20%
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 provide the knowledge and understanding to make informed choice when selecting materials for design and manufacture

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

LO1. As part of a small team successfully conceptualise and develop a design solution to a given problem.
LO2. Evaluate the market and analyse the most appropriate manufacturing methods, including materials, costing and pricing of the design.
LO3. Critically analyse environmental issues, safety and life cycle considerations of the design
LO4. As part of a small team give a design presentation to real or simulated customers selling the design prototype.

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: 143**

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

Summary of Module Content

Conceptualise and develop design ideas through drawing and modelling
Carry out research and apply creative strategies for generating design ideas
Apply the design process during engineering projects Product design.
Apply costing methods throughout the design process
Research marketing strategies relevant to the market sector of the design.
Reporting manufacture processes for the most cost effective methods for the design.
Presenting your findings to a board of individuals for the purpose of funding

SUMMARY OF TEACHING AND LEARNING *[Use HESA KIS definitions}*

Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	30	15 x 2hr lectures
Academic Support	15	A mix of group and individual tutorial time
Guided development workshops	30	15 x 2hrs group work
Self-Study	110	Project work and individual reading
Case Study Seminars	10	5 x 2hr seminars based upon directed independent study
Workshop time	0	
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	Report	100%	LO1,LO2,LO3,
Practice	P1	Presentation	100%	L04.

Updated by: Mayowa Adio Date: July 2024	**Approved by**: H Galpin-Mitchell Date: July 2024

Essential Reading List;

Ashby, M.F. (2005) *Material Selection in Mechanical Design,* Elsevier, London.

Cather, H et al (2001) *Design Engineering,* Butterworth Heinemann, Oxford.

Blessing, L and Bauert, F (2005) *Engineering Design a systematic approach,* 2nd Edtn, Springer, Damstadt.

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

Darbyshire, A. (2010) *Mechanical Engineering*. Elsevier, Oxford

Web sites
www.azom.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: CITY2095	**MODULE TITLE: Composites Materials for the Marine Industry**

CREDITS: 20	**FHEQ LEVEL: 5**	**JACS CODE: J610**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
The module introduces the practical and theory of composites used in the marine industry and analyse the different manufacturing processes and the impact of these on the strength of the material

.

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:

- To stimulate and widen the students knowledge of composites used within the marine industry
- Provide the student with the knowledge of polymer composites and an appreciation of how they can provide engineering solutions within the marine industry

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

LO17. Analyse the different manufacturing processes and materials used within the marine industry.
LO18. Calculate the mechanical and physical properties of a polymer matrix.
LO19. Demonstrate the practical applications of composites used within the marine industry.
LO20. Analyse the quality assurance processes and the destructive and non-destructive testing of polymer composites.

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: Martin Boulter	**OTHER MODULE STAFF:**

Summary of Module Content
Analyse manufacturing methods, processes and materials
Calculate void contents, resin contents, resin fibre ratios and strength of laminate
Testing processes visual, crucible, shearography, x-ray and other associated testing methods
Practical applications associated with production, prototypes, renewable and military

SUMMARY OF TEACHING AND LEARNING *[Use HESA KIS definitions}*		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	60	30 x 2hr Lectures
Academic Support	15	A mix of Group and Individual Tutorials
Directed Independent Study	30	Guided reading and homework
Self-Study	85	Suggested reading and assignments
Workshop time	10	5 x 2hr Practical sessions
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	Written Report	100%	LO17; LO18; LO20
Practice	P1	Practical	100%	LO19

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

Essential Reading List;
Jones, R (2015) *Mechanics of composite materials*, CRC Press, Florida 2nd Edition
Barbero, E J (2010) *Introduction to composite materials design*, CRC Press, Florida 2nd Edition
Strong, A B (2007) *Fundamentals of Composites Manufacturing: Materials, Methods, and Applications*, Society Manufacturing Engineers, Michigan 2nd Edition
Bhagwan, D A and Broutman L J and Chandrashekhara, K (2017) *Analysis and Performance of Fiber Composites*, Wiley-Blackwell, New Jersey 4th 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: CITY 2096	**MODULE TITLE: Engine Technology and Marine Propulsion Systems**

CREDITS: 20	**FHEQ LEVEL:5**	**JACS CODE: H333**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module investigates a number of engineering principles which underpin the design and operation of power plant and drive systems used in the Marine Industry. It includes some elements of thermodynamics, fluid mechanics, but emphasis is on the mechanics of engines and propulsion systems.

.

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

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

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

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To provide knowledge and understanding to support and develop a range of topics associated with plant engineering, modern engine technology, combustion processes, the art of diagnosis and marine propulsion systems.

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

LO21. Conceptualise different internal combustion engine systems.
LO22. Analyse combustion processes, emissions and control measures.
LO23. Assess transmission systems and justify applications to different types of vessels.
LO24. Apply Propeller design theory to individual 3d Propeller projects and justify its design to peers through seminars

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: 120**

MODULE LEADER:	**OTHER MODULE STAFF:**
Mike Stone	**(Workshop Technician)**

Summary of Module Content

Engine Technology; Construction, 2 stroke, 4 stroke, gas turbine.
Combustion processes for Petrol, Diesel and Gas turbine, investigating the causes of emissions and the effects on BMEP, Engine Power and Torque. Thermodynamic calculations for Thermal Efficiency and Mechanical Efficiency on a range of engines.
Petrol and Diesel Fuel systems; Carburation, methods of injection, port injection, direct injection, electronic control.
cooling systems, exhaust systems,
engine diagnostics; mechanical testing, audible, measurements, tech spec and tolerances
Electrical diagnostics, wiring diagrams, methods of evaluation.
Electronic diagnostics. ECU interrogation, K Line, CAN bus System Interaction.

Propulsion Systems; Gearbox construction, investigate different gearing solutions for given design scenarios, calculating gearing calculations, choosing the best type of gears, choosing materials, bearing loadings, etc.
Drive shafts; drive couplings, support systems, hull exit, sealing and maintaining a watertight hull.
Propellers; Prop design, fixed pitch, variable pitch, podded and azimuthing propulsors, ducted propellers, waterjet propulsion. Propeller geometry, pitch, rake skew, section geometry and definition.
Propeller performance

SUMMARY OF TEACHING AND LEARNING *[Use HESA KIS definitions}*		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	40	20 x 2hr lectures
Tutorial	15	A mix of group and individual tutorial time
Directed Independent Study	55	Identified independent study prior to seminars
Self-Study	70	Coursework and individual reading
Case Study Seminars	10	5 x 2hr seminars based upon directed independent study
Workshop time	10	5 x 2hr practical workshop investigations
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	E_			
	T1	In Class Test	100%	LO1,LO2,
Coursework	C			
Practice	P1	Assessed Seminar	100%	LO3,LO4

Updated by: Mike Stone Date: August 2025	**Approved by**: Hollie Galpin-Mitchell Date: August 2025

Essential Reading List;

Carlton, J, (2012) *Marine Propellers and Propulsion,* Butterworth Heineman, Oxford. 3rd Edition

Mollenhauer, K & Tsschoke,H. (2010) *Handbook of Diesel Engines*, Springer, London.

Duret,P (1993) *A New Generation of Two-Stroke Engines for the Future*, Editions Technip, Paris.

Boyce, M.P. (2012) *Gas Turbine Engineering Handbook,* Butterworth Henineman, Oxford.

Would,K.H. and Stapersma,D. (2003) *Design of Propulsion and Electric Power Generation Systems,* IMarEST, London.

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 2097	**MODULE TITLE: Project**

CREDITS: 20	**FHEQ LEVEL: 5**	**JACS CODE: H700**

PRE-REQUISITES: **None**	**CO-REQUISITES :** **None**	**COMPENSATABLE:** **No**

SHORT MODULE DESCRIPTOR:
An integration of the skills and knowledge developed in other modules of the course within a major piece of work that allows the student to develop the ability to work individually; and with others, within a defined timescale and given constraints, to produce an acceptable and viable solution to an agreed brief.

.

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

WRITTEN EXAMINATION		COURSEWORK		PRACTICE	
E1 (Formally scheduled)		**C1**	75%	**P1**	25%
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:
This module develops students' ability to use the knowledge and skills they develop on an engineering program to complete a realistic work project.
It is designed to bring small groups of students together into a multi-disciplinary team, coordinating their individual skills and abilities. This allows them to work, within a defined timescale and given constraints, to produce an acceptable and viable solution to an agreed brief. The module aims to integrate the skills and knowledge developed in other modules of the course within a major piece of work that reflects the type of performance expected in a modern engineering environment.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
LO1. Present and agree specifications and project planning
LO2. Implement the project within agreed procedures and to specification.
LO3. Evaluate the project
LO4. Present a project evaluation.

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: 115**

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

Summary of Module Content

Identify requirements relevant to project type – plant layout, installation, product design, etc. Formulate plan of action, allocate responsibilities (for group projects), initiate a project log-book. Implementation: decision-making methods, quality and resource requirements, fitness for purpose, costs, brainstorming, mind mapping, log-book entries.

Evaluate critical analysis of the specification, Gantt charts, sequencing, scheduling, critical path methods, networking and application of Project Evaluation and Review Techniques (PERT).

Present a project evaluation, including a written report, log-book record of all events and an oral presentation. The presentation should be made to known audiences (peer groups, tutors) and unknown audience (actual or simulated, customer or client).

SUMMARY OF TEACHING AND LEARNING		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	10	5 x 2hr lectures
Formative assessments	4	4x1hr gateway reviews
Practical workshop sessions	40	20 x 2hr practical workshop and development time
Competition	3	3hr end of module competition
Formal Presentation	1	1 hr dragons den presentation of project
Independent Study	120	Individual and Group Research for Project related problem solving.
Tutorial	22	A mixture of group and individual tutorials
Total	**200**	

Category	***Element***	***Component Name***	***Component weighting***	***Comments*** *Include links to learning objectives*
Written exam	E_			
	T_			
Coursework	C1	Portfolio	100%	LO1, LO2, LO3.

Practice	P1	Formal Presentation	100%	LO4

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