UNIVERSITY OF PLYMOUTH

PROGRAMME QUALITY HANDBOOK 2023-24

FdSc Mechanical Engineering

Welcome and Introduction

Welcome to FdSc Mechanical Engineering delivered at Oceans Gate Campus by City College Plymouth.

Mechanical engineering graduates are sought by employers in almost all sectors of the engineering industry. This programme will develop a broad knowledge base of Mechanical Engineering theory as well as essential skills required in the field of Engineering. Where applicable students will carry out practical design projects, using proven theory to solve engineering problems and study new technologies and engineering theory, engineering codes and specifications. During the course guided learning and varied dynamic assessments will provide essential knowledge and understanding which will lead into the final group project, where teams of engineers from different engineering disciplines will work together sharing their knowledge and compete in given challenges.

Throughout many of these modules, you will use a range of computer based simulation and development applications. This will be supplemented by practical activities to allow for evaluation of industry standard design.
Delivery will be supported by Industry standard software and development environments within specialist workshop/ laboratory areas.
Delivery is planned to be flexible to accommodate both our part time and full time students.
Improved employability skills are developed within this programme due to its close liaison with local employers.

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 at: http://hemoodle.cityplym.ac.uk/course/view.php?id=3305
- Your Module, Teaching, Learning and Assessment Guide
  - available at: http://hemoodle.cityplym.ac.uk/course/view.php?id=3605
- Plymouth University's Student Handbook
  - available at: https://www.plymouth.ac.uk/your-university/governance/student-handbook

Programme Specification

Final award title	**FdSc Mechanical Engineering**
Level X Intermediate award title(s)	**N/A**
Level X Intermediate award title(s)	**N/A**
UCAS code	**39M8**
JACS code	**H300**
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 accreditation of EngTec status through IMechE and the IET.

Distinctive Features of the Programme and the Student Experience

Mechanical engineering graduates are sought by employers in almost all sectors of the engineering industry. This programme will develop a broad knowledge base of Mechanical Engineering theory as well as essential skills required in the field of Engineering. Where applicable students will carry out practical design projects, using proven theory to solve engineering problems and study new technologies and engineering theory, engineering codes and specifications. During the course guided learning and varied dynamic assessments will provide essential knowledge and understanding which will lead into the final group project, where teams of engineers from different engineering disciplines will work together sharing their knowledge and compete in given challenges.

Throughout many of these modules, you will use a range of computer based simulation and development applications. This will be supplemented by practical activities to allow for evaluation of industry standard design.

Delivery will be supported by Industry standard software and development environments within specialist workshop/ laboratory areas.

Delivery is planned to be flexible to accommodate both our part time and full time students.

Improved employability skills are developed within this programme due to its close liaison with local employers.

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

Programme Structure

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

Full Time FdSc

Stage 1			
Module Code	**Module Title**	**No. of Credits**	**Core / Optional**
CITY1077	Engineering Mathematics	20	**Core**
CITY1078	Engineering Science 1	20	**Core**
CITY1091	Engineering Materials	20	**Core**
CITY1092	CAD Techniques & Design	20	**Core**
CITY1095	Applications of Pneumatics and Hydraulics	20	**Core**
CITY1098	Management Techniques in Mechanical Engineering	20	**Core**
Stage 2			
CITY2092	Engineering Science 2	20	**Core**
CITY2093	Advanced CAD & FEA	20	**Core**
CITY2099	Thermo and Fluids	20	**Core**
CITY2094	Engineering Design	20	**Core**
CITY2100	Engine Technology and Auxiliary Systems	20	**Core**
CITY2097	Project	20	**Core**

Stage 1			
Module Code	**Module Title**	**No. of Credits**	**Core / Optional**
CITY1077	Engineering Mathematics	20	**Core**
CITY1078	Engineering Science 1	20	**Core**
CITY1091	Engineering Materials	20	**Core**
CITY1092	CAD Techniques & Design	20	**Core**
Stage 2			
CITY1095	Applications of Pneumatics and Hydraulics	20	**Core**
CITY1098	Management Techniques in Mechanical Engineering	20	**Core**
CITY2092	Engineering Science 2	20	**Core**
CITY2093	Advanced CAD & FEA	20	**Core**
Stage 3			
CITY2099	Thermo and Fluids	20	**Core**
CITY2094	Engineering Design	20	**Opt**
CITY2100	Engine Technology and Auxiliary Systems	20	**Core**
CITY2097	Project	20	**Core**
CITY2101	Further Naval Architecture & Regulatory Framework	20	**Opt**

Part Time FdSc

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 engineering systems.
2. Provide the opportunity to 'learn through design' via practical and project based work, particularly within the context of Mechanical Engineering.
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

Knowledge and understanding

On successful completion graduates should have developed:

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

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 mechanical engineering tasks.
2) The ability to use results of analysis to solve mechanical engineering problems, apply technology and implement solutions.
3) The ability to Implement design solutions and contribute to their evaluation through projects focused upon the Mechanical Engineering Industry.

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.

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.

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 mechanical 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 HNC Mechanical Engineering	
A-level/AS-level	Normal minimum entry requirements are 48 on new UCAS Tariff at A-level to include Grade D in Maths or Physics
BTEC National Diploma/QCF Extended Diploma	Candidates are interviewed before an offer is made. But an equivalent of 48 UCAS points in an Engineering Subject
Access to Higher Education at level 3	Candidates are interviewed before an offer is made. Pass an Access to HE Diploma in Science with an equivalent of 48 UCAS points
Welsh Baccalaureate	Normal minimum entry requirements are an equivalent of 48 on new UCAS Tariff include Maths, Physics or Engineering
Scottish Qualifications Authority	Normal minimum entry requirements are an equivalent of 48 on new UCAS Tariff include Maths, Physics or Engineering
Irish Leaving Certificate	Normal minimum entry requirements are an equivalent of 48 on new UCAS Tariff include Maths, Physics or Engineering
International Baccalaureate	Normal minimum entry requirements are an equivalent of 48 on new UCAS Tariff include Maths, Physics or Engineering
Non Standard Qualifications with experience	All non-standard applicants are interviewed by the tutor and screened centrally to ensure impartial oversight.

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.

Progression criteria for Final and Intermediate Awards

Students who successfully complete the FdSc may progress to:

1. BSc (Hons) Integrated Technologies Engineering at City College Plymouth (Top up)
2. BEng Mechanical Engineering (University of Plymouth) – Level-6 (requiring FdSc with 60% aggregate)

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 Mechanical 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

Transitional Arrangements

The College is currently delivering both an HNC and FdSc Mechanical 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.

Part time first years will need to study CITY1092 CAD Techniques and Design from 2017 /2019 instead of CITY1098 Management Techniques in Mechanical Engineering in their second year, and the standard part time third year from 2018/2019.
Part time second years will need to study CITY2093 Advanced CAD and FEA instead of CITY2094 Engineering Design from 2018/2019.
All new students from September 2017 will enrol on the new structure.

Mapping and Appendices:

ILO's against Modules Mapping

Please see appendix 13.1

Assessment against Modules Mapping

Please see appendix 13.2

Skills against Modules Mapping

Please see appendix 13.3

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;	A Use engineering knowledge and understanding to apply technical and practical skills.	1.Develop engineering knowledge and understanding to apply technical and practical skills.	8.1.1) The ability to review and select appropriate techniques, procedures and methods to undertake tasks. 8.1.2) The ability to use appropriate scientific, technical or engineering principles.	CITY1077, CITY1078, CITY1091, CITY1092, CITY1095, CITY1098.
Ability to evaluate and interpret these within the context of that area of study;	B) Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems or services.	1. Develop engineering knowledge and understanding to apply technical and practical skills. 2. Provide an opportunity to 'contribute towards design' via practical and project based work.	8.1.1) The ability to review and select appropriate techniques, procedures and methods to undertake tasks. 8.1.2) The ability to use appropriate scientific, technical or engineering principles. 8.2.1) The ability to identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions. 8.2.2) The ability to identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact.	CITY1077, CITY1078, CITY1091, CITY1092, CITY1095, CITY1098.
Ability to present, evaluate and interpret qualitative and quantitative data;	D) Use effective communication and interpersonal skills.	1 Develop engineering knowledge and understanding to apply technical and practical skills. 4. Provide an opportunity to use effective communication and interpersonal skills.	8.2.2) The ability to identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact. 8.3.1) Use oral, written and electronic methods for the communication of technical and other information.	CITY1077, CITY1078, CITY1091, CITY1095.

Students will be able to: Evaluate the appropriateness of different approaches to solving problems related to their area of study; Communicate the results of their study accurately and reliably and with structured and coherent argument	A) Use engineering knowledge and understanding to apply technical and Practical skills. B) Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems or services. D) Use effective communication and interpersonal skills.	1. Develop engineering knowledge and understanding to apply technical and practical skills. 2. Provide an opportunity to 'contribute towards design' via practical and project-based work. 3. Provide an opportunity for 'accepting and exercising personal responsibility.' 4. Provide an opportunity to use effective communication and interpersonal skills. 4. Provide an opportunity to use effective communication and interpersonal skills.	8.1.1) The ability to review and select appropriate techniques, procedures and methods to undertake tasks. 8.1.2) The ability to use appropriate scientific, technical or engineering principles. 8.2.1) The ability to identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions. 8.2.2) The ability to identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact. 8.3.1) Communicate ideas and information; through verbal and written forms using appropriate terminology and presentation of data.	CITY1077, CITY1078, CITY1091, CITY1095. CITY1078, CITY1091, CITY1092, CITY1095, CITY1098.
Undertake further training and develop new skills within a structured and managed environment	E) Make a personal commitment to an appropriate code of professional conduct, recognising obligations to society, the profession and the environment.	3. Provide an opportunity for 'accepting and exercising personal responsibility.'	8.4.1) Good student centred learning skills which will promote lifelong learning and a commitment to continuing professional development to achieve flexibility within the work environment.	CITY1077, CITY1078, CITY1091, CITY1092, CITY1095, CITY1098.
Students will also have: The qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility	C) Accept and exercise personal responsibility.	2. Provide an opportunity to 'contribute towards design' via practical and project based work. 3. Provide an opportunity for 'accepting and exercising personal responsibility.'	8.4.1) Good student centred learning skills which will promote lifelong learning and a commitment to continuing professional development to achieve flexibility within the work environment. 8.5.1) Undertake engineering work in a way that contributes to sustainable development.	CITY1077, CITY1078, CITY1091, CITY1092, CITY1095, CITY1098.

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; 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;	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. 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. 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 Mechanical Engineering. 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 Mechanical Engineering. 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 mechanical engineering practice. 8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Mechanical Engineering Sector. 8.1.3) A sound evidence-based approach to problem-solving and contribute to continuous improvement. 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 mechanical engineering tasks. 8.2.2) The ability to use results of analysis to solve mechanical 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. 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.	CITY2092, CITY2093, CITY2099, CITY2094, CITY2100, CITY2097. CITY2092, CITY2093, CITY2099, CITY2094, CITY2100, CITY2097.

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;	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. B3, Implement design solutions and contribute to their evaluation. C1, Plan for effective project implementation.	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 Mechanical Engineering. 4. Provide the opportunity to develop communication, data collection and analysis, ingenuity, problem solving, application and diagnostic skills.	8.5.2) The ability to monitor, analyse and evaluate mechanical 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 mechanical engineering tasks. 8.2.2) The ability to use results of analysis to solve mechanical 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 Mechanical 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, CITY2093, CITY2099, CITY2094, CITY2100, CITY2097.
An understanding of the limits of the knowledge, and how this influences analyses and interpretations based on that knowledge	A2, Use a sound evidence-based approach to problem-solving and contribute to continuous improvement.	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 mechanical 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, CITY2099, CITY2094, CITY2100, CITY2097.

Students will be able to: 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 mechanical engineering practice. 8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Mechanical 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 mechanical engineering tasks. 8.2.2) The ability to use results of analysis to solve mechanical 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 Mechanical Engineering Industry.	CITY2092, CITY2093, CITY2099, CITY2094, CITY2100.
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.	8.5.1) The ability to select and use appropriate equipment to perform engineering tasks. 8.5.2) The ability to monitor, analyse and evaluate engineering systems.	CITY2094, CITY2097, CITY2100.
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 Mechanical Engineering.	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. 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, CITY2099, CITY2094, CITY2100, 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 project based work, particularly within the context of Mechanical Engineering. 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.	8.1.1) A sound theoretical approach to the application of technology in mechanical engineering practice. 8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Mechanical 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 mechanical engineering tasks. 8.2.2) The ability to use results of analysis to solve mechanical 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 Mechanical 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. 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 mechanical engineering systems.	CITY2092, CITY2093, CITY2099, CITY2094, CITY2100, CITY2097.

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)	CITY1095 Applications of Pneumatics and Hydraulics (Core)	CITY1098 Management Techniques in Mechanical Engineering (Core)	CITY 2092 Engineering Science 2 (Core)	CITY 2093 Advanced CAD & FEA (Core)	CITY 2099 Thermo and Fluids (Core)	CITY 2094 Engineering Design (Core)	CITY 2100 Engine Technology and Auxiliary Systems (Core)	CITY 2097 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)	CITY1095 Applications of Pneumatics and Hydraulics (Core)	CITY1098 Management Techniques in Mechanical Engineering (Core)	CITY 2092 Engineering Science 2 (Core)	CITY 2093 Advanced CAD & FEA (Core)	CITY 2099 Thermo and Fluids (Core)	CITY 2094 Engineering Design (Core)	CITY 2100 Engine Technology and Auxiliary Systems (Core)	CITY 2097 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 mechanical engineering practice. 8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Mechanical 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 Mechanical 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. 8.4.2) The ability to liaise with employers through work based design	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 Kawasaki Precision Machinery Ernesettle And Guest lecture	8.5.2) The ability to monitor, analyse and evaluate mechanical engineering systems. 8.1.1) A sound theoretical approach to the application of technology in mechanical engineering practice. 8.1.2) The ability to identify, review and select techniques, procedures and methods to undertake engineering tasks within the Mechanical Engineering Sector. 8.2.3) The ability to Implement design solutions and contribute to their evaluation through projects focused upon the Mechanical 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 mechanical engineering systems.	CITY2100 Engine Technology and Auxiliary Systems	LO3. Assess transmission systems and justify applications to different types of applications. LO4. Apply knowledge of auxiliary systems to pump design project	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. Kawasaki Precision Machinery has agreed to conduct a work based visit to show the students all aspects of Pump design and manufacture, prior to students participating in a pump design project prior to their final assessment of Engine Technology and Auxiliary Systems CITY2100.				

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: June 2017	**FACULTY/OFFICE: Academic Partnerships**
DATE OF IMPLEMENTATION: Sept 2017	**SCHOOL/PARTNER: City College Plymouth**
DATE(S) OF APPROVED CHANGE:	**TERM: All Year**

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.

ACADEMIC YEAR: 2023/2024	**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	30	Group and individual academic tutorials
Independent Study	110	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)
Coursework	C1	Assignment	100%	LO1-4

Updated by: Owais Raja Date: July 2022	**Approved by**: L Chatfield Date: July 2022

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

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

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.

ACADEMIC YEAR: 2023/24	**NATIONAL COST CENTRE: 114**

MODULE LEADER: Tamal Barman	**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	60	30 x 2hr sessions
Tutorial	30	30 x 1hr
Independent Study	110	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
Coursework	C_	Assignment *(Report on in class experiments)*	100%	LO3, LO4

Updated by: Tamal Barman **Date:** July 2022	**Approved by:** Lance Chatfield **Date:** July 2022

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**

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***

<u>the extranet as a guide for prospective students.</u> Further details for current students should be provided in module guidance notes.

ACADEMIC YEAR: 2023/24	**NATIONAL COST CENTRE: 117**

MODULE LEADER: Owais Raja	**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
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*
Coursework	C1	Lab report Essay	50% 50%	LO1, LO2 LO3, LO4

Updated by: Owais Raja Date: July 2022	**Approved by:** Lance Chatfield **Date:** July 2022

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

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

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

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

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

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

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

Professional body minimum pass mark requirement: N/A

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

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

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

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.

ACADEMIC YEAR: 2023/24	**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*
Coursework	C1	Portfolio of Evidence Report	75% 25%	LO1, LO2, LO3 LO4

Updated by: Martin Boulter Date: July 2022	**Approved by**: Lance Chatfield Date: July 2022

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

MODULE CODE: CITY1095	**MODULE TITLE:** Applications of Pneumatics and Hydraulics

CREDITS: 20	**FHEQ LEVEL:4**	**JACS CODE: H141**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*

Learners will investigate pneumatic and hydraulic diagrams, examine the characteristics of components and equipment and evaluate the applications of pneumatics and hydraulics.

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

WRITTEN EXAMINATION		COURSEWORK		PRACTICE	
E1 (Formally Scheduled)	**50 %**	**C1**	**50 %**	**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:

The aim of this unit is for the student to develop their knowledge and understanding of fluid power systems, including hydraulics and pneumatics where they will analysis and evaluate circuits, systems and identify specifications for given engineering problems.

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

LO1. Interpret fluid power diagrams
LO2. Analyse the construction and operation of pneumatic and hydraulic components, equipment and plant
LO3. Design pneumatic and hydraulic circuits
LO4. Evaluate industrial applications of pneumatics and hydraulics.

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

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.*

ACADEMIC YEAR: 2023/24	NATIONAL COST CENTRE: 115

MODULE LEADER: Owais Raja	OTHER MODULE STAFF:

Summary of Module Content

Investigate fluid diagrams and review either fluid power diagrams and report on the design of either a pneumatic or hydraulic multi-actuator sequential operation using a minimum of four actuators or review fluid power diagrams and report on the design of either a pneumatic or hydraulic reversible rotary actuation with speed control in both directions.

Analyse the construction and operation of pneumatic and hydraulic components, equipment and plant

Design pneumatic and hydraulic circuits (design and draw a circuit for either a pneumatic or hydraulic multi-actuator sequential operation, including emergency stop functions)

Evaluate industrial applications of pneumatics and hydraulic.

SUMMARY OF TEACHING AND LEARNING ***[Use HESA KIS definitions}***		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	40	20 x 2hrs lectures
Tutorial	15	A mix of group and individual tutorials
Directed Independent Study	50	Guided self-study
Self-Study	85	Individual self-study
Workshop time	10	5 x 2hrs workshop 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	Exam	100%	LO2, LO4
Coursework	C1	Design Assignment	100%	LO1, LO3

Updated by: Tamal Barman **Date:** July 2022	**Approved by:** Lance Chatfield **Date:** July 2022

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

MODULE CODE: CITY1098	MODULE TITLE: Management Techniques in Mechanical Engineering

CREDITS: 20	FHEQ LEVEL: 4	JACS CODE: N210

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

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

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ELEMENTS OF ASSESSMENT *[Use HESA KIS definitions}*					
WRITTEN EXAMINATION		COURSEWORK		PRACTICE	
E1 (Formally scheduled)		**C1**	60%	**P1**	40%
E2 (OSCE)		**C2**		**P3**	
T1 (in-class test)		**A1**			

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

Professional body minimum pass mark requirement: N/A

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

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
LO1 – Discuss contemporary management techniques used to improve and optimise operational activity, including the associated supply chains, within the field of mechanical engineering.
LO2 – Apply financial analysis and planning control methods to mechanical 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 mechanical engineering as a result of increasing competitiveness, globalisation and environmental issues.
LO5 – Evaluate and communicate lean enterprise concepts applied to the mechanical 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

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.

ACADEMIC YEAR: 2023/23	**NATIONAL COST CENTRE: 18**

MODULE LEADER: Owais Raja	**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*
Coursework	C	Report	100%	LO1, LO2, LO3
Practice	P	Presentation	100%	LO4, LO5

Updated by: Owais Raja Date: July 2022	**Approved by**: Lance Chatfield Date: July 2022

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:	**CO-REQUISITES:**	**COMPENSATABLE:**
None	None	**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.

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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:
LO1 - Investigate the effects of stress and strain on solid bodies.
LO2 - Analyse structures, stress, strain and deflection in 2d and 3d bodies.
LO3 - Analyse rotational dynamics, balancing and simple harmonic motion.
LO4 - 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**

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.

ACADEMIC YEAR: 2023/24	**NATIONAL COST CENTRE: 114**

MODULE LEADER: Tamal Barman	**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	T1	In Class Test	100%	LO3, LO4
Coursework	C1	Engineering Problem Assignment	100%	LO1, LO2

Updated by: Tamal Barman Date: July 2022	**Approved by**: Lance Chatfield Date: July 2022

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: None	CO-REQUISITES:None	COMPENSATABLE: 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:

LO1. Use computer software to produce complex 3D models of engineering components.
LO2. Analyse structures, stress strain and deflections using FEA techniques.
LO3. Produce engineering drawings, BOMs and Manufacturing information to international standards.
LO4. 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

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.

ACADEMIC YEAR: 2023/24	**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*
Coursework	C1	Portfolio	100%	LO13, LO14, LO15, LO16

Updated by: Martin Boulter Date: July 2022	**Approved by**: Lance Chatfield Date: July 2022

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**

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.

ACADEMIC YEAR: 2023/24	**NATIONAL COST CENTRE: 143**

MODULE LEADER: Martin Boulter	**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
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*
Coursework	C1	Report	100%	LO1,LO2,LO3,
Practice	P1	Presentation	100%	L04.

Updated by: Martin Boulter Date: July 2022	**Approved by**: Lance Chatfield Date: July 2022

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.

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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**

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.

ACADEMIC YEAR: 2023/24	**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*
Coursework	C1	Portfolio	100%	LO1, LO2, LO3.
Practice	P1	Formal Presentation	100%	LO4

Updated by: Martin Boulter Date: July 2022	**Approved by**: Lance Chatfield Date: July 2022

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

MODULE CODE: CITY2099	MODULE TITLE: Thermo and Fluids

CREDITS: 20	FHEQ LEVEL: 5	JACS CODE: H311/H141

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module investigates the knowledge and understanding of thermodynamic system and fluid mechanics, in order to solve problems by analytical method and also familiarize with industrial machineries.

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ELEMENTS OF ASSESSMENT *[Use HESA KIS definitions}*					
WRITTEN EXAMINATION		COURSEWORK		PRACTICE	
E1 (Formally scheduled)	60%	**C1**	40%	**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 an understanding of idealised thermodynamic system in industrial application to develop knowledge on modern machinery performance.
- To introduce the fundamental concepts and equations of fluid mechanics to understand behaviour of a body under fluid, flow of fluid and their application.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
LO1 - Investigate and apply basic thermodynamic principles and laws to analyse performance of idealised forms of thermodynamic systems.
LO2 - Investigate idealised thermodynamic principle to corresponding real systems.
LO3 - Investigate properties of fluid and solve problems on pressure and fluid static.
LO4 - Analyse fluid continuity system.
LO5 - Study and analyse fluid Viscosity and pipe flow.

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

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.

ACADEMIC YEAR: 2023/24	**NATIONAL COST CENTRE: 117**

MODULE LEADER: Owais Raja	**OTHER MODULE STAFF:**

Summary of Module Content

LO1: Investigate and apply basic thermodynamic principles and laws to analyse performance of idealised forms of thermodynamic systems. Heat and temperature, temperature scale, heat capacity, specific heat, Laws of thermodynamics, Thermodynamic systems- constant pressure, constant volume, isothermal and adiabatic system, P- V diagram, reversible and irreversible processes, gas law, Cp and Cv,

LO2: Investigate idealised thermodynamic principle to corresponding real systems. Carnot cycle, heat engine, refrigerator, air condition and heat pump, efficiency and COP, entropy, Internal combustion engine, Otto cycle, Diesel cycle, reciprocating, rotary, spark ignition, compression ignition, 4 stroke and 2 stroke engine, compression ratio, fuel power, brake power, indicated power, efficiency, Air compressor, classification of air compressor, Volumetric and isothermal efficiency, Steam and gas turbine, Impulse and reaction, classification of turbines, boiler, heat exchanger, turbine efficiency, power output.

LO3: Investigate properties of fluid and solve problems on pressure and fluid static Pressure, density, relative density, atmospheric pressure, absolute pressure, gauge pressure, manometer, barometer, Pascal's principle, Hydraulic lift, hydraulic machines, Archimedes principle, Buoyancy and stability, Floatation, Centre of pressure, immersed surface.

LO4: Analyse fluid continuity system Mass and volume flow rate, equation of continuity, Bernoulli's equation, Application of Bernoulli's equation, Pressure and head loss, potential, velocity and pressure head.

LO5: Study and analyse fluid Viscosity and pipe flow Shear stress in fluid, strain rate and velocity gradient, Newton's law of viscosity, Dynamic viscosity, kinematic viscosity, Newtonian and not Newtonian flow, Laminar and turbulent flow, Reynolds number, critical velocity.

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	55	Identified independent study prior to seminars
Self-Study	70	Coursework 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*
Coursework	C1	Assignment	100%	LO1, LO3
Written Exam	E1	Examination	100%	LO2, LO4, LO5

Updated by: Owais Raja Date: July 2022	**Approved by**: Lance Chatfield Date: July 2022

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 2100	**MODULE TITLE: Engine Technology and Auxiliary Systems**

CREDITS: 20	**FHEQ LEVEL:5**	**JACS CODE: H320**

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

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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 auxiliary systems to include pumps, gearboxes and drive trains.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
LO1 - Conceptualise different internal combustion engine systems.
LO2 - Analyse combustion processes, emissions and control measures.
LO3 - Assess transmission systems and justify applications to different types of applications.
LO4 - Apply knowledge of auxiliary systems to a pump design project.

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

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.

ACADEMIC YEAR: 2023/24	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Tamal Jarman	**OTHER MODULE STAFF: (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.
Auxiliary 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, pulley systems, v belts new technology such as CVT torodial drives.
Pumps; Positive Displacement Pumps; sliding vane, gear, bi-rotor,rotary lobe pumps 2 and 3 lobe. Centrifugal pumps; single stage, multi stage, self priming and end suction. Diaphragm and Piston Pumps.

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	T1	In Class Test	100%	LO1,LO2,
Practice	P1	Assessed Seminar	100%	LO3,LO4

Updated by: Tamal Barman Date: July 2022	**Approved by**: Lance Chatfield Date: July 2022