Plymouth University

Academic Partnerships

CORNWALL COLLEGE (Camborne)

Programme Quality Handbook

FdSc Engineering

Academic Year 2017-2018

If you require any part of this Handbook in larger print, or an alternative format, please contact:

HE Operations
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Please note:

All the information in this Handbook is correct at the time of printing.

The Cornwall College Group is proud of its teaching and research and it undertakes all reasonable steps to provide educational services in the manner set out in this Handbook and in any documents referred to within it. It does not, however, guarantee the provision of such services. Should industrial action or circumstances beyond the control of the College interfere with its ability to provide educational services, the University undertakes to use all reasonable steps to minimise the resultant disruption to those services.

PROGRAMME SPECIFICATION[1]

Programme Title: FdSc Engineering

Internal Programme Code: FT 3043 PT 6126

Partner Delivering Institution: Cornwall College, Camborne

Start Date: 2016-17

First Award Date: 2017-18

Date(s) of Revision(s) to this Document:

This programme specification template aligns with recommendations within the UK Quality Code for Higher Education[2]. The information provided, by the programme proposer, in each section is definitively agreed between the delivering institution and Plymouth University at approval. Therefore any requests for changes to content (post the conditions set at approval) must follow Plymouth University's procedures for making changes to partnership programmes[3].

Contents

[1] This Programme Specification contains no information pertaining and/or referring to any individual and is therefore appropriate for dissemination as a public document.

[2] QAA, 2011, Chapter A3: The Programme Level, UK Quality Code for Higher Education: http://www.qaa.ac.uk/en/Publications/Documents/quality-code-A3.pdf , last accessed 28th July 2014 [n.b. this includes *'Appendix 2: Working with programme specifications: A leaflet for further education colleges'*]

[3] If required please contact Academic Partnerships Programme Administration for assistance.

PS1. Programme Details

Awarding Institution:	Plymouth University
Partner Institution and delivery site (s):	Cornwall College
Accrediting Body:	N/A
Language of Study:	English
Mode of Study:	Full-time and Part-time
Final Award:	FdSc
Intermediate Award:	HNC
Programme Title:	Engineering
UCAS Code:	H100
JACS Code:	TBC
Benchmarks:	This programme has been produced in line with the FHEQ and the Foundation Degree Characteristics. It has also been aligned to the QAA Subject Benchmark covering Engineering (2015)
Date of Programme Approval:	22 April 2016

PS2. Brief Description of the Programme

This text is definitively approved at programme approval and therefore may be directly used for promotion of the programme without the need for further confirmation (approx. 200-250 words)

This foundation degree in engineering is designed to meet the skills demand of employers across the South West region. The programme brings together the identified requirement for tomorrow's engineers to be well versed in engineering principles and also to have greater in-depth knowledge of a specialist area of their choosing. The first offers a broad engineering curriculum covering mathematics, engineering science, material science, computer-aided design, manufacturing, automation, control systems, business and employability skills. Whilst the second year continues your development in mathematics and also offers a choice of three specialist pathways:

- Mechanical Design and Manufacture;
- Electrical, Electronic and Control Engineering;
- Marine technology, Naval Architecture and Maritime Operations.

Additionally you will learn how to manage projects successfully and will put those skills into practice when you undertake a major research project of your own.

Completing the programme will make you more versatile, more employable, multi-skilled and professionally competent in your chosen career. A variety of different teaching styles enables you to learn in an effective manner, ensuring that you have the right knowledge and skills to excel in the workplace. The programme will also equip you with communication, team working and time management skills, making you a more effective student and employee.

PS3. Details of Accreditation by a Professional/Statutory Body (if appropriate)

N/A

PS4. Exceptions to Plymouth University Regulations

(Note: Plymouth University's Academic Regulations are available internally on the intranet: https://staff.plymouth.ac.uk//extexam/academicregs/intranet.htm)

None

PS5. Programme Aims

This programme will deliver:

1. A challenging and stretching learning experience that equips learners with the necessary knowledge, skills and behaviours to excel in their chosen engineering field of study.
2. A comprehensive curriculum, covering the fundamental principles of engineering, alongside specialist pathways, aligned to the needs of engineering companies from the region.
3. A vocational study programme that develops the necessary practical research, design, production and operational skills to solve engineering problems and implement the solutions.
4. Work ready graduates with the capability to solve problems and develop solutions for the issues facing engineering companies.
5. A vehicle for delivering the higher level engineering skills needed by business and industry in Cornwall, including the priority sectors identified by the Local Enterprise Partnership.

PS6. Programme Intended Learning Outcomes (ILO)

By the end of this programme the student will be able to:

ILO1: knowledge and understanding – Demonstrate a knowledge and understanding of essential facts, concepts, theories and principles of engineering disciplines and the underpinning science and mathematics and will have an appreciation of the wider multidisciplinary engineering context and the underlying principles.

ILO2: cognitive and intellectual skills – Apply appropriate quantitative science and engineering tools to the analysis of problems and be able to demonstrate creative and innovative ability in the synthesis of solutions in formulating design thus working at an appropriate level of detail.

ILO3: transferable skills – Translate engineering designs and solutions into real, practical outputs and outcomes, thereby generating economic and social benefit to business and society.

ILO4: employment – Recognise and develop their own employability and professional skills through opportunities to discuss and reflect upon individual and team tasks.

ILO5: practical – Develop transferable skills that will be of value in a wide range of situations and include those skills required in the management of problem solving, communication, and working with others, as well as making effective use of general IT facilities and information retrieval.

PS7. Distinctive Features

This text is definitively approved at programme approval and therefore may be directly used for promotion of the programme without the need for further confirmation:

1. The programme offers students access to industry standard software and equipment to design, analyse and rapid prototype engineering designs and solutions.
2. Extensive links with employers throughout Cornwall means that students learn how to solve real engineering problems that are relevant to companies and have the opportunity to experience work placements within those companies.
3. On completion of the core curricula students opt for a specialist pathway that deepens their knowledge and skills in an area of interest to them.
4. The programme benefits from a range of engineering businesses in the region which provide advice on curriculum design and currency through their membership of an active industry advisory board.
5. Complex problems that involve application of technical knowledge, business contextualisation, people skills and prioritisation are introduced to students requiring them to adopt professional project management techniques and skills to solve.
6. Organised trips to engineering companies allow students direct access to current technology and the people who apply that technology to engineering problems.
7. Learners experience a work placement that provides context to the specialist pathway they undertake and their research project.

PS8. Student Numbers

The following provides information that should be considered nominal, and therefore not absolutely rigid, but is of value to guide assurance of the quality of the student experience, functional issues around enabling progression opportunities to occur and staffing and resource planning:

Minimum student numbers per stage = 5

*Target student numbers per stage =*10

*Maximum student numbers per stage =*15

PS9. Progression Route(s)

Approved "progression route(s)" are those where successful achievement in this programme enables direct alignment to join a stage of another programme. This is an approach employed primarily for Foundation Degree students to "top-up" to complete a Bachelor degree, but may be employed for other award types.

This is in part an automated admissions criterion and therefore progression may be impacted on by availability of a position on the progression award; however progression opportunity, if not available in the first year of application, is guaranteed within 3 years.

Progression arrangements with institutions other than Plymouth University carry an increased element of risk. It is necessary for the delivering partner institution to obtain formal agreement from that institution to guarantee progression for existing students on the programme. For progression to Plymouth University, should there be the need to withdraw the progression route programme(s) then either this will be delayed to provide progression or appropriate solutions will be found. This arrangement is guaranteed for existing students that complete their programme of study with no suspensions or repeat years and who wish to progress immediately to the University.

Upon successful completion of the FdSc Engineering students will be able to progress to Stage 3 (Level 6) of the BSc (Hons) Mechanical Design and Manufacture programme at Plymouth University.

The contribution of marks from prior levels of study to the progression award is governed by University regulations.

PS10. Admissions Criteria

Qualification(s) Required for Entry to this Programme:	Details:
Level 2: - **Key Skills requirement / Higher Level Diploma:** **and/or** - **GCSEs required at Grade C or above:**	Literacy, numeracy and science (level 2) and/or Maths and English
Level 3: at least one of the following:	
AS/A Levels	120 points (to include at least 80 from A2) Maths/Science/Engineering/Design Technology or similar
Advanced Level Diploma:	PM at BTEC National Certificate in Engineering
BTEC National Certificate/Diploma:	PPP at BTEC Extended Diploma in Engineering
VDA: AGNVQ, AVCE, AVS:	PPP at BTEC National Diploma in Engineering
Access to HE or Year 0 provision:	Pass in a relevant subject area
International Baccalaureate:	24 point score
Work Experience:	Considered on an individual basis
Irish / Scottish Highers / Advanced Highers:	Normally 120 points to include Higher or Advanced (considered on an individual basis)
Other HE qualifications / non-standard awards or experiences:	Considered on an individual basis
APEL / APCL[4] possibilities:	Applications are considered on an individual basis in accordance with Plymouth University Regulations.
Interview / Portfolio requirements:	All candidates will be interviewed
Independent Safeguarding Agency (ISA) / Disclosure and Barring Service (DBS) clearance required:	No

PS11. Academic Standards and Quality Enhancement

The Programme Leader/Manager (or the descriptor) leads the Programme Committee in the Plymouth University's annual programme monitoring process (APM), as titled at the time of approval. APM culminates in the production, maintenance and employment of a programme level Action Plan, which evidences appropriate management of the programme in terms of quality and standards. Any formally agreed changes to this process will continue to be followed by the Programme Leader/Manager (or other descriptor) and their Programme Committee.

Elements of this process include engaging with stakeholders. For this definitive document it is important to define:

[4] Accredited Prior Experiential Learning and Accredited Prior Certificated Learning

Subject External Examiner(s):

Dr Meinwen Taylor, Senior Lecturer, University of South.

Dr Barrie Kennard, Chief Executive, Leadership & Management Wales, PESD module.

An Interim visit by External Examiner (EE) (usually between January and February) will review work that has been marked, consult students and feed back to the programme manager and module leaders and course team.

Subject Assessment Panel (SAP) reviews the assessment marking and is scrutinised by the subject EE. Representatives of the team review and present their module marks for each student on the programme.

The annual Award Assessment Board (AAB) takes place with Programme Manager, the awarding body's partnership member and the External to receive the students work and confer progression or award.

Additional stakeholders specific to this programme:

Students have the opportunity to discuss the programme independently, twice a year in the Student Review. This forms part of the discussion for the annual programme monitoring in the autumn and spring of each academic year.

The Student Perception Questionnaire (SPQ) is administered during the year and feeds into the programme review.

Students Representatives attend Annual Programme Monitoring (APM) to contribute student views alongside Module Leaders, the Programme Manager and the Assistant Registrar to monitor module delivery and the course provision.

Local engineering companies consulted in the design of this programme, including Pendennis Shipyard, Severn Subsea Technology, FIC Ltd, Rodda's Creamery, WES hard Metals, and Imerys.

Curriculum meetings take place once a month to review progression, department provision, resources and staffing.

PS12. Programme Structure[5]

The following structure diagram(s) provides the current structure for this programme:

FHEQ level: 4 For: Full Time				
F/T Route Year	When in Year? (i.e. Autumn, Spring etc)	Core or Option Module	Credits	Module
1	All year	Core	20	Analytical Methods for Engineers 1 (CORC193)
1	All year	Core	20	Engineering Science 1 (CORC194)
1	All year	Core	20	Engineering Applications in a Business Context (CORC1202)
1	All year	Core	20	Manufacture and Materials (FENG137)
1	All year	Core	20	Instrumentation, Control and Automation (CORC1244)
1	All year	Core	20	Personal and Employability Skills Development (CORC1013)
FHEQ level: 5 For: Full Time				
F/T Route Year	When in Year? (i.e. Autumn, Spring etc)	Core or Option Module	Credits	Module
2	All year	Core	20	Analytical Methods for Engineers 2 (CORC2202)
2	Semester 1	Core	20	Engineering Science 2 (CORC2223)
2	All year	Core	20	Engineering Project (CORC2222)
2	Semester 2	Mechanical Option	20	Mechanical Engineering Principles (CORC2193)
2	All year	Mechanical Option	20	Engineering Design (CORC2194)
2	All year	Mechanical Option	20	Manufacturing Systems (CORC2195)
2	Semester 2	Electrical Option	20	Electrical Engineering Principles (CORC2196)
2	All year	Electrical Option	20	Electronics (CORC2197)
2	All year	Electrical Option	20	Control Systems (CORC2198)
2	Semester 2	Marine Option	20	Marine Technology (CORC2199)

2	All year	Marine Option	20	Naval Architecture (CORC2200)
2	All year	Marine Option	20	Maritime Operations (CORC2201)

FHEQ level: 4 For: Part Time				
F/T Route Year	When in Year? (i.e. Autumn, Spring etc)	Core or Option Module	Credits	Module
1	All year	Core	20	Analytical Methods for Engineers 1 (CORC193)
1	All year	Core	20	Engineering Science 1(CORC194)
1	All year	Core	20	Personal and Employability Skills Development (CORC1013)
2	All year	Core	20	Manufacture and Materials (FENG137)
2	All year	Core	20	Instrumentation, Control and Automation (CORC1244)
2	All year	Core	20	Engineering Applications in a Business Context (CORC1202)
FHEQ level: 5 For: Part Time				
F/T Route Year	When in Year? (i.e. Autumn, Spring etc)	Core or Option Module	Credits	Module
3	All year	Core	20	Analytical Methods for Engineers 2 (CORC2202)
3	Semester 1	Core	20	Engineering Science 2 (CORC2223)
3	Semester 2	Mechanical Option	20	Mechanical Engineering Principles (CORC2193)
3	Semester 2	Electrical Option	20	Electrical Engineering Principles (CORC2196)
3	Semester 2	Marine Option	20	Marine Technology (CORC2199)
4	All year	Mechanical Option	20	Engineering Design (CORC2194)
4	All year	Mechanical Option	20	Manufacturing Systems (CORC2195)
4	All year	Electrical Option	20	Electronics (CORC2197)
4	All year	Electrical Option	20	Control Systems (CORC2198)
4	All year	Marine Option	20	Naval Architecture (CORC2200)
4	All year	Marine Option	20	Maritime Operations (CORC2201)
4	All year	Core	20	Engineering Project (CORC2222)

PS13. Explanation and Mapping of Learning Outcomes, Teaching & Learning and Assessment

Developing graduate attributed and skills, at any level of HE , is dependent on the clarity of strategies and methods for identifying the attributes and skills relevant to the programme and where and how these are operationalised. The interrelated factors of Teaching, Learning and Assessment and how these are inclusive in nature, are fundamentally significant to these strategies and methods, as are where and how these are specifically distributed within the programme.

Ordered by graduate attributes and skills, the following table provides a map of the above, plus an exposition to describe and explain the ideas and strategy of each. Therefore, subsequent to the initial completion for approval, maintenance of this table as and when programme structure changes occur is also important:

FHEQ level: 4					
Definitions of Graduate Attributes and Skills Relevant to this Programme	**Teaching and Learning Strategy / Methods**	**Prog Aims**	**Prog intended Learning Outcomes**	**Range of Assessments**	**Related Core Modules**
Knowledge / Understanding:					
Learners will acquire knowledge and understanding of the essential facts, concepts, theories and principles of their engineering discipline, and its underpinning science and mathematics. They must have an appreciation of the wider multidisciplinary engineering context and its underlying principles. They must appreciate the social, environmental, ethical, economic and commercial considerations affecting the exercise of their engineering judgement. By the end of this level of this programme the students will be able to demonstrate for a threshold pass: Learners must demonstrate an ability to solve engineering problems through the application	Primary: Lectures, tutorials, exercises, case studies, research. Secondary/Supplementary: Tutor feedback, peer learning, independent learning	1 & 2	1 & 2	Formative class exercises using engineering science and mathematical principles. Coursework applying engineering theory. (CORC	(CORC 193) (CORC 194)

FHEQ level: 4					
Definitions of Graduate Attributes and Skills Relevant to this Programme	**Teaching and Learning Strategy / Methods**	**Prog Aims**	**Prog intended Learning Outcomes**	**Range of Assessments**	**Related Core Modules**
numerical, computational, analytical and technical skills using appropriate tools.				193), (CORC 194) Examinations directed towards the solution of numerical problems. (CORC 193), (CORC 194)	
An explanation for embedding Knowledge and Understanding through Teaching & Learning and Assessment at this level of the programme: At level 4 knowledge and understanding is embedded through a focus on the solution of a range of engineering problems using analytical and engineering science techniques. Learners are presented with a typical engineering event such as change of velocity or bending of a beam and then theoretical techniques are discussed. Learners are encouraged to make links between the reality of the engineering and the representative model through a series of directed questions. A solution is initially elaborated by the tutor and later rehearsed by the learner. This is then later reinforced through formative problem solving exercises undertaken by learners individually and individual reflection on the wider context within which the engineering problem sits.					
Cognitive and Intellectual Skills:					
Learners will acquire the cognitive and intellectual skills to systematically approach the task of making engineering concepts become reality using innovative and sustainable methods and techniques. By the end of this level of this programme the students will be able to demonstrate for a threshold pass: Learners must demonstrate the ability to synthesise and evaluate solutions to engineering tasks and problems, make judgements on how best those solutions are implemented to create economic and social value.	Primary: Lectures, tutorials, exercises, case studies, research. Secondary/Supplementary: Tutor feedback, peer learning, independent learning	1 & 2	1 & 2	Formative class exercises using CAD software, materials testing and control hardware. Coursework investigating, costing and evaluating solutions. (CORC 1202) Examination on manufacturing and materials. (FENG 137)	(CORC 1202) (FENG 137) (CORC 1244)
An explanation for embedding Cognitive and Intellectual Skills through Teaching & Learning and Assessment at this level of the programme: At level 4 cognitive and intellectual skills are developed through the introduction of challenges that require learners to appropriately apply the acquired knowledge and skills to a series of tasks in design, decision making and system analysis. Learners are guided through the process of making sense of the work produced and evaluating the usefulness of it. This achieved through using real design tasks, material specification decisions and system requirements. Learners experience a sense of achievement and					

FHEQ level: 4					
Definitions of Graduate Attributes and Skills Relevant to this Programme	**Teaching and Learning Strategy / Methods**	**Prog Aims**	**Prog intended Learning Outcomes**	**Range of Assessments**	**Related Core Modules**
fulfilment through producing and documenting comprehensive solutions to authentic problems.					
Key Transferable Skills:					
Learners will develop a range of transferable skills covering analysis of information, problem solving, effective communication, formulate arguments, apply themselves within a business context in a socially valuable way. By the end of this level of this programme the students will be able to demonstrate for a threshold pass: Learners will demonstrate the ability to exercise personal and professional responsibility, conducting high level analysis of designs that are business costed and sustainable.	Primary: Lectures, tutorials, Secondary/Supplementary: Peer feedback	4	3	Formative basic skills testing, research skills, class discussion. Coursework producing engineering designs and analysis. (CORC 1202) Coursework developing production plans and materials testing. (FENG 137) Coursework conducting personal skills audit and reflection on team task. (CORC 1013) Examination on materials analysis and selection. (FENG 137)	(CORC 1202) (FENG 137) (CORC 1013)
An explanation for embedding Key Transferable Skills through Teaching & Learning and Assessment at this level of the programme: At level 4 key transferable skills through learners taking responsibility for managing the process of developing solutions that require subsequent analysis and evaluation. The teaching focuses on presentations of case studies or group tasks that require learners to collectively engage with in order that complete solutions are delivered. During this process learners develop personal strategies for ensuring their decisions and actions have both currency and merit.					
Employment Related Skills:					

FHEQ level: 4					
Definitions of Graduate Attributes and Skills Relevant to this Programme	**Teaching and Learning Strategy / Methods**	**Prog Aims**	**Prog intended Learning Outcomes**	**Range of Assessments**	**Related Core Modules**
Learners will develop a range of employment related skills that enable them to analyse engineering problems and develop appropriate solutions and communicate to a non-technical audience. By the end of this level of this programme the students will be able to demonstrate for a threshold pass: Learners will be the able to demonstrate that they can evaluate solutions and make decisions on the basis of cost, sustainability and social value.	Primary: Lectures, tutorials, work placements Secondary/Supplementary: Tutor, peer and employer feedback	4 & 5	2, 3 & 4	Formative case study analysis. Coursework report on product design and development (CORC 1202) Coursework report on materials analysis and testing (FENG 137) Personal reflection on performance within group task work (CORC 1013)	(CORC 1202) (FENG 137) (CORC 1013)
An explanation for embedding Employment Related Skills through Teaching & Learning and Assessment at this level of the programme: At level 4 employment related skills are developed through tasks and activities that replicate employment experiences. Learners must provide design solutions, undertake laboratory tests and manage group tasks in according to specified procedures and time frames. Personal performance and efficacy is evaluated and assessed by the both tutor and learner, resulting in personal development plans.					
Practical Skills:					
Learners will be able to successfully and pragmatically apply the knowledge and skills they have acquired in the workplace. By the end of this level of this programme the students will be able to demonstrate for a threshold pass: Learners must demonstrate they can use a range of computational techniques to analyse engineering applications and develop appropriate and costed design solutions.	Primary: Lectures, tutorials, workshops Secondary/Supplementary: Independent study, work placement	3, 4 & 5	2 & 3	Formative exercise in CAD drafting, material testing and manufacturing demonstration. (CORC 1202), (FENG 137) Coursework producing and	(CORC 1202) (FENG 137) (CORC 1244)

FHEQ level: 4					
Definitions of Graduate Attributes and Skills Relevant to this Programme	**Teaching and Learning Strategy / Methods**	**Prog Aims**	**Prog intended Learning Outcomes**	**Range of Assessments**	**Related Core Modules**
				costing. (CORC1202) Coursework testing and measuring material properties. (FENG 137)	
An explanation for embedding Practical Skills through Teaching & Learning and Assessment at this level of the programme: At level 4 practical skills are acquired by learners through completion of tasks such as data analysis, component design, material testing, presentations and computer programming. Learners are introduced to computer-aided design software, metrology equipment and industrial process controllers. Learners most demonstrate that they are knowledgeable and capable of using such equipment and can produce meaningful outputs from using them.					

FHEQ level: 5					
Definitions of Graduate Attributes and Skills Relevant to this Programme	**Teaching and Learning Strategy / Methods**	**Prog Aims**	**Prog intended Learning Outcomes**	**Range of Assessments**	**Related Core Modules**
Knowledge / Understanding:					
Learners will acquire critical knowledge and understanding of the essential facts, concepts, theories and principles of their engineering discipline, and its underpinning science and mathematics. They must have a comprehensive appreciation of the wider multidisciplinary engineering context and its underlying principles. They must fully appreciate the social, environmental, ethical, economic and commercial considerations affecting the exercise of their engineering judgement. By the end of this level of this programme the students will be able to demonstrate for a threshold pass: Learners must demonstrate an ability to solve complex engineering problems through the application of numerical, computational, analytical and technical skills using appropriate tools and must demonstrate deep knowledge and understanding of mathematics and their chosen specialist subjects.	Primary: Lectures, tutorials, exercises, case studies, research. Secondary/Supplementary: Tutor feedback, peer learning, independent learning	1 & 2	1 & 2	Formative class exercises higher mathematical principles. Coursework applying theory to solve complex engineering problems.	(CORC2202 CORC2222)
An explanation for embedding Knowledge and Understanding through Teaching & Learning and Assessment at this level of the programme: At level 5 knowledge and understanding are developed through the introduction of open ended engineering problems that require theoretical and analytical techniques to produce a range of potential solutions that must be subsequently evaluated in order to produce an effective solution. The problems presented are very often focused upon engineering systems that have technical, operational, environmental and human dimensions. Assessment methods at this level demand synthesis of fully analysed and well reasoned reports that demonstrate learners have fully explored the complexity of the problem posed and used a range of evaluative methods in order to present a competent and robust solution.					
Cognitive and Intellectual Skills:					

FHEQ level: 5					
Definitions of Graduate Attributes and Skills Relevant to this Programme	**Teaching and Learning Strategy / Methods**	**Prog Aims**	**Prog intended Learning Outcomes**	**Range of Assessments**	**Related Core Modules**
Learners will further develop the cognitive and intellectual skills to systematically analyse engineering concepts and produce innovative and sustainable solutions for the benefit of society. By the end of this level of this programme the students will be able to demonstrate for a threshold pass: Learners must demonstrate the ability to synthesise and critically evaluate solutions to complex engineering tasks and problems, make judgements on how best those solutions are implemented to create high level economic and social value.	Primary: Lectures, tutorials, exercises, case studies, research. Secondary/Supplementary: Tutor feedback, peer learning, independent learning	1 & 2	1 & 2	Formative class exercises solving complex engineering problems using a range of analytical and theoretical techniques. Coursework providing solutions to complex engineering problems. Research and development report.	(CORC2202) (CORC2222
An explanation for embedding Cognitive and Intellectual Skills through Teaching & Learning and Assessment at this level of the programme: At level 5 learners develop cognitive and intellectual skills further through the critical analysis of complex engineering concepts, producing designs and solutions that demonstrate high technical and social value. Learners are guided through the process of problem definition, secondary research, analysis, evaluation and decision through a series of initial formative tasks and activities, eventually building towards the presentation of a case study or hypothesis.					
Key Transferable Skills:					
Learners will further develop a wide range of transferable skills covering analysis and evaluation of information, complex problem solving, effective written and verbal communication, formulation of complex arguments, competently apply themselves managing projects within a business context in a socially valuable way. By the end of this level of this programme the students will be able to demonstrate for a threshold	Primary: Lectures, tutorials,	4	3	Formative basic skills testing, research skills,	(CORC2203)

FHEQ level: 5					
Definitions of Graduate Attributes and Skills Relevant to this Programme	**Teaching and Learning Strategy / Methods**	**Prog Aims**	**Prog intended Learning Outcomes**	**Range of Assessments**	**Related Core Modules**
pass: Learners will demonstrate the ability to exercise personal and professional responsibility and accountability, conducting high level analysis of designs that are business costed, sustainable with social merit.	Secondary/Supplementary: Peer feedback			class discussion. Project management plan. Research report.	(CORC2222)
An explanation for embedding Key Transferable Skills through Teaching & Learning and Assessment at this level of the programme: At level 5 learners gain professional project management, research skills and decision making skills through the execution of self-directed assessment tasks such as the development of a project plan based upon a real case study and the presentation of a research piece. Whilst supervision is provided the key decisions and judgements are made by the learners themselves.					
Employment Related Skills:					
Learners will develop a range of employment related skills that enable them to analyse engineering problems and develop appropriate solutions and communicate to a non-technical audience. At level 5 learners will have a range of employment skills gained through a work placement. By the end of this level of this programme the students will be able to demonstrate for a threshold pass Learners will be the able to demonstrate that they can evaluate solutions and make decisions on the basis of cost, sustainability and social value. At level 5 learners must demonstrate work readiness and professional attitudes.	Primary: Lectures, tutorials, work placements Secondary/Supplementary: Tutor, peer and employer feedback	4 & 5	2, 3 & 4	Formative case study analysis. Dissertation (CORC222	(CORC2222)
An explanation for embedding Employment Related Skills through Teaching & Learning and Assessment at this level of the programme: The employment related skills discussed here are embedded throughout the curriculum, providing learners with the opportunity to make themselves more effective as future employees. At level 5 learners independently conduct research in an area of their choosing and present finds to tutors, peers and employers.					

FHEQ level: 5					
Definitions of Graduate Attributes and Skills Relevant to this Programme	**Teaching and Learning Strategy / Methods**	**Prog Aims**	**Prog intended Learning Outcomes**	**Range of Assessments**	**Related Core Modules**
Practical Skills:					
Learners will be able to successfully and professionally apply the practical skills they have acquired during the course in the workplace. By the end of this level of this programme the students will be able to demonstrate for a threshold pass: Learners must demonstrate they can successfully use a wide range of engineering design and analysis skills to solve engineering problems and develop solutions which are then manage the subsequent implementation in specified timeframes.	Primary: Lectures, tutorials, workshops Secondary/Supplementary: Independent study, work placement	3, 4 & 5	2 & 3	Coursework project plan for an engineering project (CORC 2203) Research report (CORC2222)	(CORC 2203) (corc2222)
An explanation for embedding Practical Skills through Teaching & Learning and Assessment at this level of the programme: At level 5 further develop a range of practical skills such as data analysis, engineering design, presentation and research skills. Project milestone are introduced so that learners manage their own time to ensure they can deliver the outputs they commit to and provide regular updates on progress made. Learners present the results of their research to an audience and are required to give both explanation and validation to their work.					

PS14. Work Based/ Related Learning

WBL is an essential element of Foundation Degrees and therefore needs to be detailed here. However, for all types of HE Programmes there should be an element of employability focus through, at least, Work Related Learning, and therefore the following is applicable for all:

Learners will have the opportunity to undertake a work placement or a work related exercise within the College. Students are required to complete a minimum of 60 hours relevant work, paid or unpaid, with one or more employers, normally to be completed by the end of the Spring Term of Stage Two. The intention is that students learn by experience how theories, procedures and practices that they have learned about in stage one of the programme are used in the work place. They are assessed on their experience by means of a reflective journal, in which they focus in particular on the skills and attributes that they saw as being useful, desirable or essential in the work place, and how they propose to acquire or further refine them.

Students will normally find the placement themselves, but the student, the placement provider and the college will all follow a set of procedures that are designed to ensure that the work placement arrangement is mutually satisfactory for all parties. In particular, these procedures are designed to ensure that the health and safety of the student is accorded the same importance for the placement as in any employee/employer arrangement, and that all students gain an equitable experience in the sense that the placement meets the requirements of the course.

In summary, the procedure will work as follows:

(References in bold are to documents supplied within the student or employer pack. These packs are available on the course Moodle site)

The college will

- Identify a Work Placement Coordinator who will be the main point of contact between the college, the student and the provider.
- Ensure that the procedure for the placement is made clear to the student and to the employer as required.
- Provide clear documentation that sets out this procedure.
- Discuss a potential placement with each student to assess its suitability for the purposes of the course.
- Ensure that the work placement is given a Health and Safety check before the student starts the placement, in which it is established that the Employer Liability Insurance Policy will cover the student during the placement.
- Ensure that the HE Work Placement Agreement is signed by all parties prior the placement.

- Visit the student at the work place, if possible, and seek feedback from the employer.

The student will:

- Read the Work Placement Procedure Student Handbook
- Identify a potential work placement provider and agree with the Work Placement Coordinator on its suitability
- Approach the potential work placement provider in person, by phone or by some electronic means.
- Provide the provider with the CORC2158 Process Development module handbook so that the provider can see how the placement is to be assessed.
- Agree a placement with the provider, and identify a mentor within the placement.
- Complete a Work Placement Notification Form and return this to the Work Placement Coordinator. If required, this will initiate a Health and Safety check of the provider's premises by the designated person with this role within the college
- Complete and sign the three-party HE Work Placement Agreement. Ensure that this is also signed by the work placement provider and by the Work Placement Coordinator.
- A work placement may not begin until this form has been signed by all parties and the Health and Safety check has been carried out
- Read the Health and Safety Guidelines (Appendices A, C and D) which will be discussed in lessons prior to starting placement.
- Sign the Work Experience Health and Safety Disclaimer.
- Complete a Work Placement Induction Checklist, following an induction at the work place, which preferably will take place on the first day of the placement. This needs to be signed by the employer and the student and returned to the Work Placement Coordinator.
- Complete an Adult Student Medical Consent Form if they have any medical needs that they feel the employer should be aware of. This needs to be shared with the employer and college.
- If pregnant, the employer will need to be made aware of this, in order to support the student in the in placement. The student must complete the Pregnant Student Health and Safety Risk Assessment Form. This information needs to be shared with the employer and college.
- While on placement, ask the Mentor to sign an Attendance Card.

- See a copy of the Employer Assessment Form. This indicates the nature of the feedback that will be given by the employer to the college.
- Complete a Work Placement: Student Evaluation Form

The employer will:

- Identify a Mentor within the workplace for the student.
- Allow for a Health and Safety check of the premises and provide details of Employer Liability Insurance Policy details.
- Read through HE Work-based Learning Health and Safety Guidelines Appendix B and sign
- Sign the three-party HE Workplace Agreement
- Carry out Work Placement Induction and sign Work Placement Induction Checklist
- Discuss with student their assessment requirements and how they can be supported
- If required, support a student who may have medical needs (Adult Student Medical Consent Form) or who are pregnant (Pregnant Student Health and Safety Risk Assessment Form)
- Sign the Placement Record of Hours sheet
- Complete Employer Assessment Form

FHEQ level: 4					
WBL/WRL Activity:	**Logistics**	**Prog Aim**	**Prog Intended LO**	**Range of Assessments**	**Related Core Module(s)**
Design, analysis and costing of an engineering component based upon a specification from industry.	Students are briefed on the component specification during a visit from an industrial representative in the past this has been Teagles, an agricultural	3,4	2,3	Formative tasks to produce CAD drawing. Coursework producing and analysing an engineering component. Presentation on product	Engineering Applications in a Business Context (CORC 1202)

FHEQ level: 4					
WBL/WRL Activity:	**Logistics**	**Prog Aim**	**Prog Intended LO**	**Range of Assessments**	**Related Core Module(s)**
	equipment manufacturing company.			costing and investment appraisal.	
Provide a production plan and material specification of an engineering component.	Students visit a manufacturing company and are introduced to the manufacturing process for a component, industrial links with Curver UK.	3,4	2,3	Coursework developing a production plan for an engineering component. Coursework on material selection and development to enhance component performance. Examination with questions on material properties.	Manufacture and Materials (FENG 137)
Design and programme a control system for the control of an automated process.	Students view two industrial processes and produce control systems to automate them, one discrete control (electro-pneumatic demonstration rig) and one continuous control, previously the pumping of Poldark mine.	3,4	2,3	Formative exercise programming control hardware. Coursework designing and specifying an industrial control system	Instrumentation, Control and Automation (CORC 1244)
An explanation of this map: The teaching, learning and assessment embeds WBL/WRL throughout the programme. Learners are taken through the theory, application practice cycle during lectures so					

FHEQ level: 4					
WBL/WRL Activity:	**Logistics**	**Prog Aim**	**Prog Intended LO**	**Range of Assessments**	**Related Core Module(s)**
that an appreciation develops around the practical useful of the curriculum. Tutors relate the topics covered to specific job roles in industry such as designer, analyst, production engineer, structural engineer, materials engineer, project engineer etc. Additionally learners have the opportunity to undertake a WBL placement when they can see for themselves engineering practised for real.					

FHEQ level: 5					
WBL/WRL Activity:	**Logistics**	**Prog Aim**	**Prog Intended LO**	**Range of Assessments**	**Related Core Module(s)**
The development of a costed and resourced project plan for the delivery of an engineering project	Learners are introduced to a case study of a real engineering project from an employer	2, 3, 4	3, 4	Formative discussion of case study Case study analysis report Project management plan using Microsoft Projects	Project (CORC 2222)
Research project based upon the investigation and solution of an industry based engineering problem	During the work placement learners work on providing a solution to an engineering design or problem which eventually forms the basis of their research project	3, 4	3, 4	Work placement visits and tutor discussions Tutor sign-off of proposed project. Research report Presentation of project	
An explanation of this map: At level 5 the teaching and learning for work based learning is focused around the need for learners to experience a real engineering problem and the task of developing am appropriate solution. Learners are introduced to a range of research and project tools and techniques so that they can independently gather, analyse and organise					

FHEQ level: 5					
WBL/WRL Activity:	**Logistics**	**Prog Aim**	**Prog Intended LO**	**Range of Assessments**	**Related Core Module(s)**
data, and also plan and resource a project plan to achieve identified outcomes. Learners experience individual tutor support to guide them through the process, whilst still maintaining independent thinking and decision-making capability. The learners experience culminates with the presentation of a research report and presentation to tutors, peers and industry representatives, who all provide constructive feedback to the process.					

Appendix – Definitive 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: **CORC193**	**MODULE TITLE:** **Analytical Methods for Engineers 1**

CREDITS: 20	**FHEQ Level: 4**	**JACS CODE: H100**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module will provide analytical mathematical knowledge concepts and techniques required by the students to enable successful use of fundamental algebra, trigonometry, calculus, statistics and probability, analysis, modelling and solutions to engineering problems.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***

WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**50%**	**C1** (Coursework)	**50%**	**P1** (Practical)	**%** or Pass/Fail (delete as appropriate)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
This module is intended to underpin and link with those modules which are analytical in nature and to extend basic skills in algebra, trigonometry and calculus. The module will also introduce complex numbers, vectors and matrices and use them in an engineering context.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
1. Interpolate engineering situations and solve problems using algebraic methods.
2. Evaluate engineering situations and solve problems using trigonometric methods.
3. Analyse and model engineering situations and solve problems using the calculus
4. Identify engineering situations and solve problems using statistics and probability

DATE OF APPROVAL:	01 May 2006	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2006	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

Additional notes (for office use only):

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: 2017 - 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Dr Richard Randall	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

1. Algebraic methods
2. Exponential, trigonometric and hyperbolic functions
3. Arithmetic and geometric
4. Power series
5. Trigonometric methods
6. Sinusoidal functions
7. Trigonometric identities
8. Introduction to differentiation, further integration, applications of calculus
9. Statistics and probability, tabular and graphical form, central tendency and dispersion, regression, linear correlation, probability, probability distributions

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

Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	44	Core Material
Tutorial	6	Additional one to one support
Guided Independent Study	150	Students are expected to put in additional time outside of taught sessions.
Total	**200**	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	***Element***	***Component Name***	***Component Weighting***	***Comments include links to learning objectives***
Written exam	E1	Examination	100% **Total = 100%**	To cover all ALOs.
	T_		% **Total = 100%**	
Coursework	C1	Coursework	100% **Total = 100%**	To cover all ALOs.
Practical	P_		% **Total = 100%**	

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations (Amanda Crowle)	4 Aug 16

Recommended Texts and Sources:

Attenborough, M., (2003). *Mathematics for Electrical Engineering and Computing*. Oxford: Newnes
Bird, J., (2004). *Higher Engineering Mathematics*. 4th. Ed. Oxford: Newnes
Bolton, W., (2000). *Mathematics for Engineering*. 2nd ed Oxford. Newnes.
Cox, B., (2001). *Understanding Engineering Mathematics*. Oxford: Newnes.
Croft, Davis, Hargreaves, (1995). *Introduction to Engineering Mathematics*, Harlow: Addison-Wesley.
Fox, H., Bolton, W., (2002) *Mathematics for Engineers and Technologists*. Oxford: Newnes.
James, Glyn , (1996). *Modern Engineering Mathematics*. Harlow: Addison-Wesley.
Mustoe, L.R. (1997) *Engineering Mathematics*, Longman
Tooley M, Dingle L, 2004. *Higher National Engineering* 2nd ed. Oxford: Butterworth-Heinemann.
http://www.math.ohio-state.edu/library/online/

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

MODULE CODE: **CORC194**	**MODULE TITLE:** **Engineering Science 1**

CREDITS: 20	**FHEQ Level: 4**	**JACS CODE: H100**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
Investigates a number of major scientific principles, which underpin the design and operation of engineering systems. Broadly based, it covers both mechanical and electrical principles.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***

WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**50%**	**C1** (Coursework)	**50%**	**P1** (Practical)	**%** or Pass/Fail (delete as appropriate)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To give an overview of the scientific principles which are required as a basis for further study in specialist engineering areas.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
1. Demonstrate an ability to investigate static and dynamic systems.
2. Evaluate and formulate aspects of engineering science
3. Investigate energy transfer in thermal systems.
4. Apply single-phase electrical theory
5. Investigate information and energy control systems.

DATE OF APPROVAL:	01 May 2006	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2006	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

Additional notes (for office use only):

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: 2017 - 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Dr John Turner	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

1. Newton's Laws of motion and energy methods
2. SHM in linear and transverse systems
3. Qualitative treatment of damping and forcing
4. Stress and strain
5. Thermal stress and strain
6. Shear Force and Bending Moment diagrams, Engineer's Theory of Bending. Torsion in circular shafts
7. Modes of heat transfer; conduction, convection (free and forced) and radiation. Single phase AC theory
8. R, L, C series and parallel circuits
9. Power factor and its correction
10. Resonant circuits
11. Synthesis and analysis of complex waveforms
12. Information systems: Use of block diagrams
13. Signals; Transducers; Amplifiers; A/D and D/A converters; Energy flow control, motor drivers, heating,
    lighting and air conditioning systems

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

Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	40	Core Material
Tutorial	6	Additional one to one support
Demonstration	2	Electrical circuits
Practical Classes and Workshops	2	Stress testing
Guided Independent Study	150	Students are expected to put in additional time outside of taught sessions.
Total	**200**	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	***Element***	***Component Name***	***Component Weighting***	***Comments include links to learning objectives***
Written exam	E1	Formal Examination	100% **Total = 100%**	All ALOs
Coursework	C1	Assignment 1 Assignment 2	50% 50% **Total = 100%**	Mechanical principles ALOs 1,2,3 Electrical principles ALOs 4,5

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations	19/01/16

Recommended Texts and Sources:

Bedford, A ., Fowler, W., (1997). *Statics*. Wokingham: Addison-Wesley.
Bolton, W., (2006). *Engineering Science*, 5th ed. Oxford: Newnes.
Bolton, W. (2004) *Higher Engineering Science*, 2nd ed. Oxford: Newnes
Hannah, J., Hillier, M., (1995). *Mechanical Engineering Science*. Harlow: Longman.
Hughes, E. , (1995). *Electrical Technology*. Hemel Hempstead: Prentice Hall.
Tooley, M., (2006). *Electronic Circuits - Fundamentals and Applications* 3rd ed. Oxford Newnes.
Tooley, M., Dingle L., (2004). *Higher National Engineering* 2nd ed. Oxford: Butterworth-Heinemann
http://stauffer.queensu.ca/
http://dir.yahoo.com/Science/

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

MODULE CODE: **CORC1013**	**MODULE TITLE:** **Personal and Employability Skills Development**

CREDITS: 20	**FHEQ Level: 4**	**JACS CODE: X900**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module is designed to equip students with the necessary knowledge and skills to develop themselves in terms of their personal and employability skills.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**%**	**C1** (Coursework)	**100%**	**P1** (Practical)	**%** or Pass/Fail (delete as appropriate)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

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

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
•Develop conceptual and practical skills in personal development planning for study at degree level and readiness for employability.
•Equip learners with baseline personal resources for study and employment such as integrity, personal responsibility, reliability and self-motivation.
•Develop learners' skills in team working, decision-making, problem solving and communication.
•Stimulate learners' creativity and encourage a focus on enterprising and challenging tasks and activity.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
1. Evaluate and benchmark own study and analysis skills, capabilities and developmental needs.
2. Demonstrate understanding of concepts relating to personal, employability skills and work related skills.
3. Reflect upon how these concepts relate to personal and professional practice.
4. Effectively manage and self-direct personal and professional learning and development.

DATE OF APPROVAL:	09 Feb 2010	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2010	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

Additional notes (for office use only):

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: 2017 – 2018	**NATIONAL COST CENTRE: 135**

MODULE LEADER: Brender Willmott	**OTHER MODULE STAFF: Relevant Site Leaders**

SUMMARY of MODULE CONTENT

•Personal Development Planning - Personal audit, professional development, career management skills.

•Intra and Interpersonal Skills - Influencing, negotiating, conflict resolution, risk taking, problem-solving, decision making, teamwork, initiative, self-esteem, leadership, innovation, creativity and enterprise.

•Successful Communication - Interview skills, CVs and letters of application, self-presentation, and presentation of information.

•Understanding the Business Context - Organizational culture, business strategy, sustainability, cultural diversity, corporate social responsibility, financial literacy.

•Project Management - Project planning, monitoring, evaluation, reporting.

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

Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	20	Core material
Seminar	12	Smaller workshop sessions where students are supported to apply learning to themselves and their specific industry
Project Supervision	8	As part of assignment 1 students have to take part in a group project, which seminar tutors set and supervise
Guided Independent Study	160	Students are expected to put in time outside of taught sessions on the group project and their own personal development and career planning
Total	**200**	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	***Element***	***Component Name***	***Component Weighting***	***Comments include links to learning objectives***
Coursework	C1	Written Essay Report	50% 50% **Total = 100%**	

Updated by:	**Date:**	**Approved by:**	**Date:**
Brender Willmott	21/05/15	HE Operations	21/05/15

Recommended Texts and Sources:

Cottrell, S. (2010) *Skills for success: the personal development planning handbook*. 2nd edn. Basingstoke: Palgrave Macmillan.

Hager, P. & Holland, S. (2007) *Graduate attributes learning and employability*. Dordrecht: Springer.

Marsh, R. (2012) *Skills for employability part two: moving into employment*. Wrexham: Christal Publishing.

Journal: *Career Development International*

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

MODULE CODE:	**CORC1245**	**MODULE TITLE:**	**Engineering Applications in a Business Context**

CREDITS: 20	**FHEQ Level: 4**	**JACS CODE: H100**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
A module designed to apply engineering concepts within a business context, in order to produce the specification and design of an engineering product, service or system.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**%**	**C1** (Coursework)	**90%**	**P1** (Practical)	**10 %** or Pass/Fail (delete as appropriate)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To provide understanding of how engineering principles are applied to the specification, design, development, production, delivery, maintenance and disposal of engineering products/services/systems whilst ensuring project management practice, business context, quality standards and environmental considerations are taken into account.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
1. Apply engineering principles to the specification and design process
2. Understand the business context
3. Manage the product development lifecycle

DATE OF APPROVAL:	21 Jan 2015	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2015	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

Additional notes (for office use only):

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: 2017-2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Richard Randall	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

Requirements Analysis, Engineering Design, Function Testing, Business Modelling, Project Management, Quality Assurance, Operations Management, Environmental Impact, Sustainability.

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

Scheduled Activities	**Hours**	**Comments/Additional Information**
Practical Classes and Workshops	24	Learners will have access to engineering design software, and instruction, such as Solidworks, Proteus and FluidSim.
Lecture	24	Theoretical aspects of the curriculum to be covered in classroom lectures.
Tutorial	2	Learners shall have one-to-one tutorial time to support their decision of which engineering application to pursue.
Guided Independent study	150	Learners will be expected to put in time outside of taught sessions and will have access to all facilities.
Total	**200**	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	***Element***	***Component Name***	***Component Weighting***	***Comments include links to learning objectives***
Written exam	E		% **Total = 100%**	
	T		% **Total = 100%**	
Coursework	C1	Formative Exercises Written Report 1 Written Report 2	0% 50% 40% **Total = 100%**	CAD drafting and product costing methods Report of design and analysis LO1 and LO2 Report of business plan LO3, learners to work in groups on this task to maximise the amount of information gathered/analysed.
Practical	P1	Presentation	10% **Total = 100%**	Presentation on development lifecyle LO4

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

MODULE CODE: **CORC1244**	**MODULE TITLE:** **Instrumentation, Control and Automation**

CREDITS: 20	**FHEQ Level: 4**	**JACS CODE: H661**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module develops an understanding of the development and integration of modern instrumentation, control and automation systems.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***

WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**50%**	**C1** (Coursework)	**%**	**P1** (Practical)	**50%**
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To develop the learner's understanding of the development and integration of modern instrumentation, control and automation systems.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
1. Describe modern instrumentation, control and automation systems
2. Analyse a given instrumentation, control and automation system
3. Apply associated principles to automate and control an engineering process
4. Evaluate the role of information and communication technology in modern control systems.

DATE OF APPROVAL:	21 Jan 2015	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2015	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:	22 April 2016	**TERM/SEMESTER:**	All Year

Additional notes (for office use only):

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: 2017 – 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Pete Thorpe	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

Instrumentation, including sensors and measurement systems; control systems, including programmable logic controllers and electrical drives; automation devices, including motors, pneumatics and hydraulics. Integration technology, including networks, distributed control and SCADA.

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

Scheduled Activities	Hours	Comments/Additional Information
Lecture	25	Theoretical aspects of the module will be covered in taught sessions.
Practical Classes and Workshops	20	Learners shall apply learning within a practical environment.
Directed Study	5	Learners to research and analyse an industrial control systems
Guided Independent study	150	Students will be expected to put in time outside of taught sessions and will have access to labs and workshops.
Total	**200**	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	*Element*	*Component Name*	*Component Weighting*	*Comments include links to learning objectives*
Written exam	E1	Exam	100% **Total = 100%**	To cover LO1
	T		% **Total = 100%**	
Practical	P1	Lab Exercises	100% **Total = 100%**	To cover LO2 and LO3

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	01/04/15	HE Operations (Amanda Crowle)	4/08/16

Recommended Texts and Sources:

Bolton, W. (2003) *Mechatronics: electronic control systems in mechanical and electrical engineering*. 3rd edn. Essex: Pearson.

Bolton, W, (2006) *Programmable Logic Controllers*, 4th ed, Newnes

Strmčnik, & S. Stefan, J (2013) *Case Studies in Control: Putting Theory to Work (Advances in Industrial Control)*. Springer

Turner, I C (1995) *Engineering Applications of Pneumatics and Hydraulics* Butterworth-Heinemann

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

MODULE CODE: **FENG137**	**MODULE TITLE:** **Manufacture and Materials 1**

CREDITS: 20	**FHEQ Level: 4**	**JACS CODE: H100**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module provides an introduction to manufacturing and materials. It includes primary and secondary forming processes and introduces the concept of process structure property relationships in engineering materials

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**50%**	**C1** (Coursework)	**50%**	**P1** (Practical)	**%** or Pass/Fail (delete as appropriate)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To develop students understanding and knowledge of basic manufacturing and materials technology enabling appreciation and 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:

1. Select and discuss a particular process for the manufacture of an engineering component listing advantages and disadvantages compared to alternatives.
2. List generic types of material together with typical physical and mechanical properties.
3. Describe the effects of processing structure and properties of engineering materials.
4. List and describe selected strengthening mechanisms, through the effect on structure and properties.
5. Analyses of material properties, through practical testing.
6. Identify and describe features of material micro and macro-structure.

DATE OF APPROVAL:	01 May 2006	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2006	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

Additional notes (for office use only):

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: 2017 – 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Dr John Turner	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

1. Primary forming processes (casting, rolling, forging, plastic processing). Secondary forming processes inclusive of tool life and cutting forces calculations. Basic metrology, the use of limits and fits.
2. Properties of materials.
3. Qualitative description of generic materials in terms of microstructure.
4. Type of polymers, additives, glass transition, and melting points.
5. Property modification techniques relationship between structure, processing, heat treatment.
6. Metal plastic deformation, hot and cold working, polymers drawing and moulding.
7. Alloying and phase of equilibrium diagrams in heat treatment.
8. Material testing through practical use of tensile and hardness testing

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

Scheduled Activities	Hours	Comments/Additional Information
Lecture	40	Theoretical aspects of the module will be covered in taught sessions.
Practical Classes and Workshops	10	Learners will have 10 hours of practical classes and workshops to investigate materials and manufacturing processes.
Guided Independent study	150	Students will be expected to put in time outside of taught sessions and will have access to labs and workshops.
Total	**200**	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	*Element*	*Component Name*	*Component Weighting*	*Comments include links to learning objectives*
Written exam	E1	Formative Exercises Formal Examination	100% **Total = 100%**	Demonstrations of processes and materials 3 hour exam covering manufacturing and materials, LOs 1- 7
	T		% **Total = 100%**	
Coursework	C1	Formative Assignment	50% 50% **Total = 100%**	Discussion of material properties Technical report on manufacture and materials selection for a product LO 1 – 8
Practical	P		% **Total = 100%**	

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations (Amanda Crowle)	04/08/16

Recommended Texts and Sources:

Callister, W.D. and Rethwisch, D.G. (2011). *Materials science and engineering.* 8th edn. Hoboken: Wiley.

Higgins, R.A., (2006). *Materials for engineers and Technicians*. 4th ed. Oxford: Newnes.

Kalpakjian, S., Schmid, S.R. and Musa, H. (2010). *Manufacturing engineering and technology (SI units).* 6th edn. Singapore: Prentice Hall.

Schey, J., (2000). *Introduction to Manufacturing Processes*. 3rd ed. Columbus: McGraw Hill.

http://www.sme.org/

http://engineering.mma.edu/

http://metals.about.com/od/journals/

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

MODULE CODE: **CORC1230**	**MODULE TITLE:** **Mechanical Engineering Technology**

CREDITS: 20	**FHEQ Level: 4**	**JACS CODE: H300**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
A module designed to develop the necessary knowledge and skills to apply mechanical engineering principles in industry in a professionally responsible way.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**%**	**C1** (Coursework)	**100%**	**P1** (Practical)	**%** or Pass/Fail (delete as appropriate)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne -Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
The module aims to prepare learners for applying higher skills to the solution of an engineering problem or issue in the learner's own industry sector in an informed and professional way.

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

1. Understand the principles of mechanical engineering technology
2. Investigate and define an industry relevant electrical engineering problem
3. Identify and discuss a robust solution

DATE OF APPROVAL:	22 Apr 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

Additional notes (for office use only):

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: 2017 – 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Dr Richard Randall	**OTHER MODULE STAFF:**

SUMMARY of MODULE CONTENT

- Mechanics of structures
- Mechanics of machines
- Fluid mechanics
- Thermodynamic systems

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

Scheduled Activities	**Hours**	**Comments/Additional Information**
Lectures	30	Classes and exercises in problem solving
Practical Classes and Workshops	20	Tutor assigned with industry knowledge
Guided independent study	150	Undertaken within work environment
Total	200	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	***Element***	***Component Name***	***Component Weighting***	***Comments include links to learning objectives***
Written exam	E_		% **Total = 100%**	
	T_		% **Total = 100%**	
Coursework	C_	Technical report	100% **Total = 100%**	To cover all ALOs
Practical	P_		% **Total = 100%**	

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations	19/01/16

Recommended Texts and Sources:

- Bird J. & Ross C. (2014). *Mechanical Engineering Principles*. Routledge.
- Tooley, M.& Dingle L. (2012). *Engineering Science: For Foundation Degree and Higher National.* Routledge.
- The Institute of Mechanical Engineers. http://www.imeche.org/

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

MODULE CODE: **CORC1222**	**MODULE TITLE:** **Electrical Engineering Technology**

CREDITS: 20	**FHEQ Level: 4**	**JACS CODE: H600**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
A module designed to develop the necessary knowledge and skills to apply electrical engineering principles in industry in a professionally responsible way.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**%**	**C1** (Coursework)	**100%**	**P1** (Practical)	**%** or Pass/Fail (delete as appropriate)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne -Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
The module aims to prepare learners for applying higher skills to the solution of an engineering problem or issue in the learner's own industry sector in an informed and professional way.

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

1. Understand the principles of electrical engineering technology
2. Investigate and define an industry relevant electrical engineering problem
3. Identify and discuss a robust solution

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

Additional notes (for office use only):

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: 2017 – 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Pete Thorpe	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

- Three phase systems
- Transformers
- D.C. Machines
- Three Phase Induction Moors
- High Voltage Technology

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

Scheduled Activities	Hours	Comments/Additional Information
Lectures	30	Classes and exercises in problem solving
Practical Classes and Workshops	20	Tutor assigned with industry knowledge
Guided independent study	150	Undertaken within work environment
Total	200	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	*Element*	*Component Name*	*Component Weighting*	*Comments include links to learning objectives*
Written exam	E		% **Total = 100%**	
	T		% **Total = 100%**	
Coursework	C1	Technical report	100% **Total = 100%**	To cover all ALOs.
Practical	P		% **Total = 100%**	

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations	19/01/16

Recommended Texts and Sources:

- Bird, J. (2014). *Electrical and Electronic Principles and Technology*. 5th edn. Abingdon: Routledge.
- Richardson, D. (2013). *Electrical and Electronic Principles*. McGraw Hill.
- The Institution of Engineering & Technology. http://www.theiet.org/

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

MODULE CODE: **CORC 1225**	**MODULE TITLE:** **Marine Engineering Technology**

CREDITS: 20	**FHEQ Level: 4**	**JACS CODE: H100**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module introduces the principles of design to take account of construction methods and materials used in the marine industry. The basics of assessing seaworthiness against material degradation will also be covered.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**%**	**C1** (Coursework)	**100 %**	**P1** (Practical)	Pass/Fail)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked:

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
The module aims to give the student the skills to develop a knowledge of the design process and material selection in enhancing build quality. The learners will undertake practical research into potential areas of material degradation and develop an understanding of the importance of maintenance procedures.
The assessment will be based on a knowledge of construction methods, design techniques, materials used in marine construction and material failure

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
1 Analyse the fundamental principles of small craft design
2. Demonstrate comprehension of common marine construction methods
3. Explain the cause and effect of common marine material failure

DATE OF APPROVAL:	April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	Sept 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	AY

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: 2017 - 2018	NATIONAL COST CENTRE:

MODULE LEADER: Martin Peart	OTHER MODULE STAFF:

SUMMARY of MODULE CONTENT

- Common construction methods, maintenance and repairs
- Materials used in construction; FRP, steel, aluminium, wood
- Material degradation and common areas of fatigue

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

Scheduled Activities	Hours	Comments/Additional Information
Formal Lecture	10	This module will be delivered through a blend of learning and research.
Practical Research	30	Practical research undertaken within a marine environment
Tutorial	10	Scheduled tutorial sessions
Independent study	150	Directed study undertaken out of lecture environment
Total	200	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	*Element*	*Component Name*	*Component Weighting*	*Comments include links to learning objectives*
Written exam	E		% **Total = 100%**	
	T		% **Total = 100%**	
Coursework	C1	Principles of small craft design	50%	A formal presentation to demonstrate a knowledge of a range of small craft design and the types of materials available
	C2	Marine construction and material failure	50% **Total = 100%**	A formal written report to demonstrate a comprehension of suitable marine construction and material requirements for a range of given types of vessel
Practical	P		% **Total = 100%**	

Updated by:	Date:	Approved by:	Date:

Recommended Texts and Sources:

Davies, P. (Editor.) and Rajapaske, Y.D.S. (Editor.) (2014) *Durability of composites in a marine environment.* Germany: Springer.

FOSSATI, F. (Author.) (2009) *Aero-hydrodynamics and the performance of sailing yachts: the science behind sailing yachts and their design*. Adlard Coles Nautical.

Larsson L.& Eliasson, R.E., 2000. *Principles of yacht design.* London: Adlard Coles Nautical

MARCHAJ, C.A. (Author.) (1996) *Sail performance : theory and practice*. London: Adlard Coles Nautical.

EBooks:

DOANE, C. (Author.) (2009) *The Modern Cruising Sailboat: A complete guide to it's design, construction and outfitting.* Maidenhead: McGraw-Hill.

EYRES, D.J. (Author.) (2001) *Ship construction*. 5th edn. Oxford: Butterworth-Heinemann.

MOLLAND, A. (Author.) (2008) *The Maritime Engineering Reference Book: A guide to ship design, construction and operation.* Aberdeen: Butterworth Heinemann

PERRY, R.H. (Author.) (2007) *Yacht design according to Perry.* Maidenhead: McGraw-Hill

Journals:

Safety at Sea International

RYA magazine

The Maritime Journal

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

MODULE CODE: **CORC2193**	**MODULE TITLE:** **Mechanical Engineering Principles**

CREDITS: **20**	**FHEQ Level:** **5**	**JACS CODE:** **H300**

PRE-REQUISITES: **CORC194**	**CO-REQUISITES:** **None**	**COMPENSATABLE:** **Yes**

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
The principles are taught in the context of applications relevant to mechanical engineering and include stress analysis, solid dynamic analysis, momentum and energy, fundamentals of thermodynamics, operational principles, uses and limitations of common energy consuming equipment.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**60%**	**C1** (Coursework)	**40%**	**P1** (Practical)	Pass/Fail)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**		**%**		

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS: To extend the understanding and use the principles of engineering science as affecting the design and manufacturing capability of the mechanical engineering manufacturing industry. To impart the ability to analyse dynamic loads, energy needs, thermodynamics and fluid mechanisms, principles of mass, momentum and energy.

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

1. Demonstrate critical understanding of the use, potential and limitations of stress analysis techniques in design, service life, cost and weight of commonly encountered engineering components.
2. Demonstrate critical understanding of the use of dynamic analysis in the description of the behaviour of dynamic systems.
3. Demonstrate knowledge of thermodynamics and heat transfer in the analysis and operation of thermal systems.
4. Evaluate the use of computer-aided engineering techniques for solving engineering problems.

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year
Additional notes (for office use only):			

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: 2017 - 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Dr Richard Randall	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

- Strength of materials; 2D stress and strain, isotropic elastic materials, theories of failure of ductile materials, von Mises theory.
- Bending; Macaulay's method, Euler's theory of struts, Rankine-Gordon relation.
- Solid dynamics; oscillating systems, free vibration, engine mounts and couplers.
- Thermodynamics and heat transfer

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

Scheduled Activities	Hours	Comments/Additional Information
Lecture	40	Presentation of theory and application of engineering principles
Practical Classes and Workshops	10	Practical demonstration of engineering principles and practice
Seminar	100	Use of computer-aided engineering software and techniques for solving problems
Guided Independent Study	40	Students are expected to put in time outside of taught sessions
Total	200	(NB: 1 credit = 10 hours or learning; 10 credits = 100 60hours, etc)

Category	*Element*	*Component Name*	*Component Weighting*	*Comments include links to learning objectives*
Written exam	E1	Formative Exercises Examination	0% 100% **Total = 100%**	Problem solving exercises 3 hour examination solving mechanical engineering problems LOs 1 - 3
	T_		% **Total = 100%**	
Coursework	C1	Formative Discussion Assignment	0% 100% **Total = 100%**	Demonstration of CAE software Technical report evaluating CAE
Practical	P_			

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations (Amanda Crowle)	4/08/16

Recommended Texts and Sources:

Bird,J. & Ross,C., 2014 *Mechanical Engineering Principles* Routledge; 3rd edition

Cengal, Y.A. & Boles, M.A., 2014 *Thermodynamics (in SI Units): An Engineering Approach* McGraw-Hill Higher Education; 8th edition

Meriam, J.L. & Kraige, L.G., 2012 *Engineering Mechanics: Dynamics (Engineering Mechanics Volume 2 2)* John Wiley & Sons; 7th Edition

Hartsuijker, C. & Welleman, J.W., 2007 *Engineering Mechanics: Volume 2: Stresses, Strains, Displacements: (Solid Mechanics and its Applications)* Springer; 2007 edition
Benham, P.P., Crawford, R.J. & Armstrong, C.G., 1996 *Mechanics of Engineering Materials* Prentice Hall; 2nd 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: **CORC2194**	**MODULE TITLE:** **Engineering Design**

CREDITS: **20**	**FHEQ Level:** **5**	**JACS CODE:** **H100**

PRE-REQUISITES: **CORC1202**	**CO-REQUISITES:** **None**	**COMPENSATABLE:** **Yes**

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module will provide students with the opportunity to develop principles and techniques, including CAD, learned at Level 4 to consider the design and manufacture of mechanical engineering components.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**%**	**C1** (Coursework)	**100%**	**P1** (Practical)	Pass/Fail)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
Students will be able to assess the latest technology, developments and future trends in mechanical engineering design and associated prototyping techniques. They will examine and analyse different 3D modelling techniques used in the mechanical engineering manufacturing and product design industries.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
1. Demonstrate and apply a sound knowledge of a variety of 3D computer modelling techniques including base level manipulation and modification.
2. Critically evaluate a range of rapid prototyping processes using additive and subtractive techniques.
3. Design, develop, produce and reflect upon an appropriate mechanical engineering component/product.
4. Evaluate the production of mechanical engineering products in terms of human, social, economic & environmental sustainability

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2016	**SCHOOL/PARTNER:**	Cornwall
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: 2017 - 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Dr Richard Randall	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

- Potential future developments in mechanical engineering design and materials
- Consideration for materials and methods in the design process
- CAD/CAM techniques of commercial software and hardware packages including data exchange
- Production of 3D models using primitives with parametric techniques, surface modelling and subsequent editing techniques for raid product development

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

Scheduled Activities	**Hours**	**Comments/Additional Information**
Lecture	15	Core Material; group/team sessions and discussions
Practical Classes and Workshops	135	Time spent in design studio and rapid prototyping workshop
Guided Independent Study	50	Students are expected to put in time outside of taught sessions
Total	200	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	***Element***	***Component Name***	***Component Weighting***	***Comments include links to learning objectives***
Written exam	E_			
	T_			
Coursework	C1	Formative Assignment 1 Assignment 2	0% 50% 50% **Total = 100%**	Demonstration and discussion of 3D printing Discussion and analysis of 2D modelling and rapid prototyping LO1 & 2 Evaluation of the design of engineering component LO3 & 4
Practical	P_			

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations (Amanda Crowle)	04/08/16

Recommended Texts and Sources:

Ashworth, M., 2010. *Materials Selection in Mechanical Design,* Butterworth-Heinemann

Simmons, C.H., 2012. *Manual of Engineering Drawing: Technical Product Specification and Documentation to British and International Standards,* Butterworth-Heinemann; 4th Revised edition

Budynas, R.G. & Nisbett, K.J., 2014. *Shigley's Mechanical Engineering Design (in SI Units)* McGraw-Hill Higher Education; 10th edition

Meybaum, H., 2014. *The art of product design: changing how things get made*. Chichester: John Wiley and sons.

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

MODULE CODE: **CORC2195**	**MODULE TITLE:** **Manufacturing Systems**

CREDITS: **20**	**FHEQ Level:** **5**	**JACS CODE:** **H710**

PRE-REQUISITES: **FENG137**	**CO-REQUISITES:** **None**	**COMPENSATABLE:** **Yes**

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module provides learners with an understanding of manufacturing systems methods used by world-class manufacturing companies and provides opportunity to apply those methods in order to effect change in a sustainable way.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**%**	**C1** (Coursework)	**100%**	**P1** (Practical)	Pass/Fail)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:

To develop the capability of learners to analyse manufacturing operations in terms of key constraints and capabilities, so that improvement opportunities can be devised and implemented in terms of flexibility, output and quality, in a sustainable way.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
1. Determine and analyse the key constraints and capabilities of a manufacturing system
2. Analyse the variation of a manufacturing process
3. Apply manufacturing systems methods in an industrial context at a strategic level
4. Identify and critically evaluate sustainable manufacturing practices

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: 2017 - 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Jenna Saberton	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

1. Theory of constraints
2. Queuing theory
3. Optimised production technology
4. Systems thinking
5. Setting strategic direction
6. Agile manufacturing
7. Lean enterprise
8. Six sigma techniques
9. Production planning
10. Sustainable manufacture

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

Scheduled Activities	**Hours**	**Comments/Additional Information**
Lectures	40	Presentation of manufacturing systems theory and application
Practical Classes and Workshops	10	Industrial visits
Self-directed study	150	Students are expected to put in time outside of taught sessions
Total	200	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	***Element***	***Component Name***	***Component Weighting***	***Comments include links to learning objectives***
Written exam	E_			
	T_			
Coursework	C1	Formative Activity Assignment 1 Assignment 2	0% 30% 70% **Total = 100%**	Visit to manufacturing businesses Analysis of a given case study LO1 & 2 Report on improvements to a real manufacturing system LO3 & LO4
Practical	P_			

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations (Amanda Crowle)	04/08/16

Recommended Texts and Sources:

Bass, I. (2006). *Six Sigma Statistics with Excel and Minitab.* Maidenhead: McGraw-Hill.

Chang, N. (2011). *Systems Analysis for Sustainable Engineering: Theory and Applications (Green Manufacturing & Systems Engineering.* McGraw-Hill Professional

Hobbs, D.P. (2004). *Lean manufacturing implementation: a complete execution manual for any size*

manufacturer. J. Ross Publishing.
Kalpakjian, S., Schmid, S.R. and Musa, H. (2010). *Manufacturing engineering and technology (SI units)*. 6th edn. Singapore: Prentice Hall.
Chartered Quality Institute. http://www.thecqi.org/
Lean Enterprise Research Centre. http://www.leanenterprise.org.uk/

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

MODULE CODE: **CORC2196**	**MODULE TITLE:** **Electrical Engineering Principles**

CREDITS: 20	**FHEQ Level: 5**	**JACS CODE: H600**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module introduces passive and reactive devices, DC and AC circuit principles, elementary electric and magnetic field theory. How electrical energy is employed in applications with reference to power transformers, circuit protection, and induction motors.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**60%**	**C1** (Coursework)	**40%**	**P1** (Practical)	
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

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

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
This module introduces passive and reactive components using basic electrical principles and elementary understanding of electrostatics and electromagnetic, behaviour of circuits though analysis of AC and DC, specifically for voltage, current, impedance and power. It aims to develop students' understanding of the underlying technology involved in the utilisation of electrical energy in some of the more important areas of electrical engineering.

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

1. Understand and apply theories relating to DC and AC circuits
2. Analyse the effect of frequency of voltage applied to 1st and 2nd order circuits
3. Critically analyse the operation of electrical equipment
4. Critically discuss the principles of circuit protection within distribution systems

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: 2017 - 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Peter Thorpe	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

1. DC circuits, theorems and laws
2. Step response in capacitive and inductive circuits.
3. Electromagnetism, magnetic induction, transformers, electrostatics, AC circuits, theorems and laws, series and parallel circuits, R and P notation.
4. Power transformers; construction, operating principles, connections.
5. Circuit protection; over-current protection devices, operating principles, earth fault protection devices.
6. Poly-phase induction motors; types operating principles, starting methods, speed control.

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

Scheduled Activities	**Hours**	**Comments/Additional Information**
Lectures	40	Core Material
Practical Classes and Workshops	10	Demonstration of electrical engineering principles through practical sessions
Guided Independent Study	150	Students are expected to put in additional time outside of taught sessions.
Total	200	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	***Element***	***Component Name***	***Component Weighting***	***Comments include links to learning objectives***
Written exam	E_	Formative Exercises Examination	0% 100% **Total = 100%**	Problem solving exercises 3 hour examination solving problems LOs 1 & 2
	T_		% **Total = 100%**	
Coursework	C1	Assignment	100% **Total = 100%**	Report on the analysis of application of electrical engineering principles applied to electrical equipment, to cover all LOs 3 & 4
Practical	P_		% **Total = 100%**	

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations	19/01/16

Recommended Texts and Sources:

Bird, J.O. (2014). *Electrical circuit theory and technology.* 5th edition. Oxford: Newnes.
Green, D.C., (1998). *Higher Electrical Principles*. Harlow: Longman.
Brown, K., Hiley, J. and McKenzie-Smith, I. (2012). *Hughes Electrical and Electronic Technology.* Essex: Pearson.
Storey, N., (1998). *A Systems Approach. London*: Addison-Wesley.
Robertson, C.R., (2001). *Fundamental Electrical and Electronic Principles*, 2nd ed. Oxford: Newnes

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

MODULE CODE: **CORC2197**	**MODULE TITLE:** **Electronics**

CREDITS: 20	**FHEQ Level:** 5	**JACS CODE: H600**

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

SHORT MODULE DESCRIPTOR:
This module provides an introduction to the principles and applications of analogue and digital electronics and instrumentation. The module will cover discrete and integrated semiconductor devices, operational amplifier circuits, sequential and combinational digital circuits, and gives an introduction to analogue-to-digital converters, sampling theory and the selection and use of sensors.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**50 %**	**C1** (Coursework)	**50%**	**P1** (Practical)	
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Engineering - Camborne

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To provide basic "literacy" in electronic circuit design and to develop awareness and skills in the fundamental techniques required for electronic circuit design, interfacing and instrumentation using analogue and digital systems and circuits.

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

1. Understand the selection, characteristics and use of discrete and integrated semiconductor devices
2. Analyse semiconductor circuit operation using small signal equivalent models.
3. Design simple operational amplifier circuits using negative feedback, including inverting and non-inverting amplifiers, filters and voltage comparators.
4. Design and implement combinational /sequential logic circuits using TTL/CMOS devices, Analog – to Digital converters [ADCs] and simple programmable logic devices [PLCs].
5. Critically discuss the selection, characteristics and interfacing of sensors and transducers for measurement and control.

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: 2017 - 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: John Turner	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

1. Revision of circuit theory: Thevenin, Norton, Kirchoff. Resonant circuits. Discrete diodes and transistors [bipolar & FET].
2. Small signal models of transistor circuits. Operational amplifiers and circuit configurations. Analogue / digital conversion and introduction to sampling theory.
3. Combinational and sequential logic circuits and PLCs.
4. Introduction to selection, use and interfacing requirements for sensors for range, velocity, acceleration, temperature, pressure, sound etc. System design using sensors, amplifiers, signal conditioning.
5. Analogue to digital conversion.

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

Scheduled Activities	**Hours**	**Comments/Additional Information**
Lectures	30	Core Material
Practical Classes/Workshops	20	Laboratory based coursework
Self-study	150	Students are expected to put in additional time outside of taught sessions
Total	**200**	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	***Element***	***Component Name***	***Component Weighting***	***Comments include links to learning objectives***
Written exam	E1	Formative Examples Examination	0% 100% **Total = 100%**	Examples exercises Formal examination – open note format. LO's 1,2,3 & 4
	T_		% **Total = 100%**	
Coursework	C1	Formative Activity Coursework	0% 100% **Total = 100%**	Demonstration of circuit design software A formal report documenting a system design to include elements of analogue and digital circuit design and instrumentation
Practical	P_		% **Total = 100%**	

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations (Amanda Crowle)	04/08/16

Recommended Texts and Sources:

Bell, D.A. (2007). *Fundamentals of electronic devices and circuits.* 5th edn. Oxford: Oxford University Press.

Bird, J. (2013). *Electrical Circuit Theory & Technology*. Routledge, ISBN 978-0-415-66285-7

Bishop, O. (2011) *Electronics: circuits and systems.* 4th edn. Boston: Newnes.

Hughes, E. (1997). *Electrical Technology*. Longman, ISBN 978-0-582-22696-8

Horowitz & Hill (2015). *The Art of Electronics* (3rd Ed). CUP. ISBN 978-0-521-80926-9

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

MODULE CODE: **CORC2198**	**MODULE TITLE:** **Control Systems**

CREDITS: 20	**FHEQ Level: 5**	**JACS CODE: H660**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module aims to provide an introduction to feedback control and the methods of relating output functionality with input data. The sensing of variables and the processing of information using modern Programmable Logic Controllers is presented.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**%**	**C1** (Coursework)	**100%**	**P1** (Practical)	
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To understand the need for feedback to improve system accuracy and dynamic performance, translate the properties of various sensors into interfacing requirements for signal processing, and develop an understanding of how modern automation is used. Examine the steady state and dynamic performance of control systems and the strategies used to implement open and closed loop control systems.

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

1. Select and interpret a variety of data from different control systems and identify the required inputs and outputs
2. Design and construct ladder logic programmes
3. Investigate and critically analyse the operating characteristic of open and closed loop systems.
4. Evaluate the use of microcontrollers and embedded control systems

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: **2017 – 2018**	NATIONAL COST CENTRE: **115**

MODULE LEADER: **Peter Thorpe**	OTHER MODULE STAFF: **None**

SUMMARY of MODULE CONTENT

1. Basic control systems, strategies, system dynamics
2. Transfer function concepts
3. Test signal, 's' plane, step and transient responses, model estimation
4. Closed loop systems
5. PLC programming
6. Sensor interfacing
7. Analysis of system frequency response and stability.

SUMMARY OF TEACHING AND LEARNING *[Use HESA KIS definitions]*		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lectures	40	Core Material
Practical Classes and Workshops	10	Practical classes using industrial controllers
Guided Independent Study	150	Students are expected to put in additional time outside of taught sessions.
Total	**200**	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	*Element*	*Component Name*	*Component Weighting*	*Comments include links to learning objectives*
Written exam	E_		% **Total = 100%**	
	T_		% **Total = 100%**	
Coursework	C1	Formative Activity Assignment 1 Assignment 2	0% 50% 50% **Total = 100%**	Programming PLC systems PLC ladder logic programme Technical report identifying appropriate control systems for a given application, to cover all ALOs
Practical	P_		% **Total = 100%**	

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations (Amanda Crowle)	04/08/16

Recommended Texts and Sources:

Bates, M. (2004). *PIC Microcontrollers*, Newnes
Bird, J. (2004). *Electrical and Electronic Principles and Technology*, 2nd ed, Oxford: Newnes
Bolton, W. (2006). *Programmable Logic Controllers*, 4th ed, Newnes
Calcutt, D., Cowan, F. and Parchizadeh, H. (2004). *8051 Microcontrollers*, Newnes
Holdsworth, B. and Woods, C. (*2002). Digital Logic Design*, 4th ed, Newnes
Robertson, CR. (2001.) *Fundamental Electrical and Electronic Principles*, 2nd ed, Newnes
Wilson, R.A. (2002.) *Embedded Systems and Computer Architecture*, Newnes

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

MODULE CODE: **CORC2199**	**MODULE TITLE:** **Marine Technology**

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

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*

This module introduces the student to marine propulsion systems to include a range of power generation devices, transmission systems and propulsion devices.

It will also look at the fundamental design of propulsion systems and their applications within the marine industry with regard to environmental issues

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***

WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**%**	**C1** (Coursework)	**100 %**	**P1** (Practical)	Pass/Fail)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement:

MODULE AIMS:

The aim of this unit is to extend the learners' knowledge and understanding of marine propulsion systems. The approach is broad-based to reflect the fact that a propulsion train may be a combination of different prime movers and transmission elements

ASSESSED LEARNING OUTCOMES: (additional guidance below)

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

1. Understand power generation methods
2. Design and analyse drive train systems
3. Specify, select and evaluate propulsion systems for given vessel types.
4. Evaluate impact of marine technology systems.

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: 2017 - 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: **Martin Peart**	OTHER MODULE STAFF: **None**

SUMMARY of MODULE CONTENT

1. Selection and advantages/disadvantages of power systems to include:
2. Spark ignition Engines, Compression Ignition Engines, Electric motors
3. Fundamentals of drive train systems to include, shaft drive, electric drive, hydraulic drive, standard propeller, surface piercing, water jet, azipod, rotary vane, and nozzle types.
4. Environmental implications of marine systems and fuels.

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

Scheduled Activities	Hours	Comments/Additional Information
Lectures	30	This module will be delivered through a blend of learning and research.
Practical research	20	Practical research undertaken within a marine environment
Independent study	150	Directed study undertaken out of lecture environment
Total	**200**	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	*Element*	*Component Name*	*Component Weighting*	*Comments include links to learning objectives*
Written exam	E_		% **Total = 100%**	
	T_		% **Total = 100%**	
Coursework	C1	Formative Activity Coursework Coursework	0% 50% 50% **Total = 100%**	Discussion of modern marine technology systems Demonstrate an understanding of power and drive train systems LOs 1 & 2 Specify and select propulsion systems for given vessel types LOs 3 & 4
Practical	P_		% **Total = 100%**	

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations (Amanda Crowle)	04/08/16

Recommended Texts and Sources:

TAYLOR D.A. (1996); *Introduction to Marine Engineering* (2nd Ed), Oxford: Butterworth-Heinemann
GERR, D (2001); *The Propeller Handbook*, Camden: Marine International
RAWSON, K.J. (Author.) and TUPPER, E.C. (Author.) (2001) *Basic ship theory. Volume 2 : chapters 10 to 16*. 5th edn. Oxford: Butterworth-Heinemann.
ROYAL INSTITUTION OF NAVAL ARCHITECTS (2001) *Waterjet propulsion III: RINA international conference, 20 - 21 February 2001, Gothenburg, Sweden*. London: Royal Instituition of Naval Architects.

EBooks:
EYRES, D.J. (Author.) (2001) *Ship construction*. 5th edn. Oxford: Butterworth-Heinemann.
MOLLAND, A. (Author.) (2008) *The Maritime Engineering Reference Book: A guide to ship design, construction and operation.* Aberdeen: Butterworth Heinemann
SORENSEN, E. (Author.) (2008) *Sorensen's Guide to powerboats: how to evaluate design, construction and performance* [eBook]. Maidenhead: International Marine McGraw-Hill

Journals:
Safety at Sea International
RYA magazine
The Maritime Journal

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

MODULE CODE: **CORC2200**	**MODULE TITLE:** **Naval Architecture**

CREDITS: 20	**FHEQ Level: 5**	**JACS CODE: H500**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module enables learners to understand basic ship construction methods, the effects on vessel stability of small and large angles of heel, to consider the effects of compartmental flooding on ship stability. Learners will explore the static and dynamic forces in ship structures, and examine their effect on buoyancy. Basic factors of propulsion and resistance to ship motion are used to provide estimates for power and fuel consumption.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***

WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**%**	**C1** (Coursework)	**60 %**	**P1** (Practical)	Pass/Fail)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**40 %**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To provide learners with an understanding of ship construction and to understand the purpose of ship static stability calculations and the effects of compartmental flooding. Understand and calculate static and dynamic forces acting on ship structures and to undertake analysis and calculate resistance to ship motion and power requirements

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
1. Understand ship construction techniques and concepts
2 Evaluate the measures necessary to preserve trim and stability at small and large angles of heel
3 Analyse the effects of compartment flooding on ship trim and stability
4 Perform calculations for the forces acting on ship structures
5 Analyse resistance to ship motion in relation to fuel consumption

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: 2017 - 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Martin Peart	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

Ship construction; Stability at small angles of heel, Stability at large angles of heel, Trim, Watertight sub-division, Effects of compartment flooding, Preventative measures; Static forces, Dynamic forces, Stress in ship structures; Ship resistance, Propellers, Powering

SUMMARY OF TEACHING AND LEARNING *[Use HESA KIS definitions]*		
Scheduled Activities	**Hours**	**Comments/Additional Information**
Lectures	30	Core Material
Practical Classes/Workshops	20	Undertake analysis of ships trim and stability
Independent study	150	Learners are expected to put in time outside of taught sessions working on formative assessment materials, research and development
Total	**200**	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	*Element*	*Component Name*	*Component Weighting*	*Comments include links to learning objectives*
Written exam	E_		% **Total = 100%**	
	T1		40% **Total = 100%**	Perform calculations for the forces acting on ship structures, analyse resistance to ship motion in relation to fuel consumption
Coursework	C1	Report	60% **Total = 100%**	Discussion of modern ship design and construction Ship construction: Demonstrate an understanding of the measures necessary to preserve trim and stability at small and large angles of heel and the effects of compartment flooding on ship trim and stability LOs 1,2, & 3
Practical	P_		% **Total = 100%**	

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations (Amanda Crowle)	04/08/16

Recommended Texts and Sources:

ASK, T. (Author.) (1998) Handbook of marine surveying. Shrewsbury: Waterline.
ASK, T. (Author.) (2007) Reeds marine surveying. 2nd edn. London: Adlard Coles Nautical.
Derret D.R. and Barrass C.B. (2006); *Ship Stability for Masters and Mates* (6th Ed), Oxford: Butterworth-Heinemann
Rawson K.J. and Tupper E.C. (2001); *Basic Ship Theory Volume 2* (5th Ed), Oxford: Butterworth-Heinemann

EBooks:
DOANE, C. (Author.) (2009) *The Modern Cruising Sailboat: A complete guide to it's design, construction and outfitting.* Maidenhead: McGraw-Hill.
EYRES, D.J. (Author.) (2001) *Ship construction*. 5th edn. Oxford: Butterworth-Heinemann.
MOLLAND, A. (Author.) (2008) *The Maritime Engineering Reference Book: A guide to ship design, construction and operation.* Aberdeen: Butterworth Heinemann
PERRY, R.H. (Author.) (2007) *Yacht design according to Perry.* Maidenhead: McGraw-Hill

Journals:
Safety at Sea International
RYA magazine
The Maritime Journal

Internet:
Various authors, http://www.libramar.net/news/naval_architecture_design/1-0-2
Sponberg Yacht design, 2010,
http://www.sponbergyachtdesign.com/THE%20DESIGN%20RATIOS.pdf

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

MODULE CODE: **CORC2201**	**MODULE TITLE:** **Maritime Operations**

CREDITS: 20	**FHEQ Level: 5**	**JACS CODE: J600**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module is intended to introduce the learner to the processes, communication systems and planning required to undertake marine operations

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**%**	**C1** (Coursework)	**100 %**	**P1** (Practical)	Pass/Fail
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To develop an awareness of the scope of operations undertaken within a marine organisation and the maritime issues and legislation that affect such operations. The learner will consider the planning and implementation of activities, facilities and personnel to ensure a successful outcome for those organisations undertaking such operations

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

1. Identify and define the elements of marine operations
2. Understand and critically discuss the effect of maritime issues and legislation
3. Analyse planning, scheduling and implementation requirements
4. Critically discuss the use of key performance indicators for personnel and facilities management

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: 2017 - 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Martin Peart	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

Health and safety legislation appropriate to the undertaking of marine operations, commercial operations of marine organisations, the role of the International Maritime Organisation, the Marine Coastguard Agency, Royal Yachting Association, Environment Agency, National Rivers Authority and Inland Waterways Association on marine organisations and their operations. The planning, scheduling and implementation of activities for marine organisations to take account of available resources (Facilities and Personnel).

Key performance indicators (KPIs), cost targets, service levels and delivery targets

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

Scheduled Activities	**Hours**	**Comments/Additional Information**
Lectures	20	Formal content
Guided Research	20	Into an agreed marine organisation
Visiting lectures	10	Local marine organisations to undertake short talks on the management of marine operations within their organisation
Independent study	150	Learners are expected to undertake independent study outside of planned sessions working on formative assessment materials, research and development
Total	200	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	***Element***	***Component Name***	***Component Weighting***	***Comments include links to learning objectives***
Written exam	E		% **Total = 100%**	
	T		% **Total = 100%**	
Coursework	C1	Formative Activity Assignment	0% 100% **Total = 100%**	Visit and discussion of marine organisation A formal report based upon an agreed marine organisation to identify the effect of maritime issues and legislation and the planning, scheduling and implementation of activities for the successful operation of that organisation
Practical	P		% **Total = 100%**	

Updated by:	Date:	Approved by:	Date:
Dave John	19/01/16	HE Operations (Amanda Crowle)	04/08/16

Recommended Texts and Sources:

Adcock, D. (Author.), HALBORG, A. (Author.) and ROSS, C. (Author.) (2001) *Marketing principles and practice*. 4th edn. Harlow, Essex: Financial Times/Prentice Hall.

Christopher, M. (Author.) (2011) *Logistics & supply chain management*. 4th edn. Harlow: Financial Times Prentice Hall.

Harvard Business Review on Managing Supply Chains. (2011) Boston, Mass.; London: Harvard Business; McGraw-Hill [distributor].

Towards a knowledge-based Europe : the European Union and the information society (2003) European Communities.

EBooks:

MCKINNON, A. (Editor.), CULLINANE, S. (Editor.), BROWNE, M. (Editor.) and WHITEING, A. (Editor.) (2010) *Green logistics: improving the environmental sustainability of logistics* [eBook]. London: Kogan Page.

Management Extra. (2005). *Quality and Operations management.* Oxford. Elsevier Butterworth-Heinemann

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

MODULE CODE: **CORC2202**	**MODULE TITLE:** **Analytical Methods for Engineers 2**

CREDITS: 20	**FHEQ Level: 5**	**JACS CODE: H100**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module will build upon the analytical mathematical knowledge concepts and techniques learnt by the students in the first year of their studies. It will enhance their ability to apply the skills they have learnt in trigonometry and calculus and introduce new concepts such as numerical analysis, vector geometry, matrices and 2nd order differential equations to enable the analysis of more complex engineering problems.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***

WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**50%**	**C1** (Coursework)	**50%**	**P1** (Practical)	**%** or Pass/Fail (delete as appropriate)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne -Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
This module is intended to underpin and link with those modules which are analytical in nature and to extend basic skills in algebra, trigonometry and calculus. The module will also introduce complex numbers, vectors and matrices and use them in an engineering context.

ASSESSED LEARNING OUTCOMES: (additional guidance below)
At the end of the module the learner will be expected to be able to:
1. Solve problems using number systems
2. Analyse problems using graphical and numerical methods.
3. Effectively use vector geometry and matrix methods
4. Analyse and model engineering situations and solve problems using ordinary differential equations

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sept 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

Additional notes (for office use only):

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: **2017 - 2018**	NATIONAL COST CENTRE: **115**

MODULE LEADER: **Peter Thorpe**	OTHER MODULE STAFF: **None**

SUMMARY of MODULE CONTENT

1. Number systems,
2. Complex Numbers,
3. Graphical techniques,
4. Numerical Integration,
5. Numerical Estimation,
6. Vector notation and operations,
7. Matrix operations and vectors,
8. Vector geometry,
9. First and second order differential equations and their applications.

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

Scheduled Activities	Hours	Comments/Additional Information
Lecture	50	Core material
Directed Study	10	Numerical Problem solving
Guided Independent Study	120	Learners expected to put in extra time outside timetabled hours
Total	200	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	*Element*	*Component Name*	*Component Weighting*	*Comments include links to learning objectives*
Written exam	E1	Formative Exercises Examination	0% 100% **Total = 100%**	Problem solving worksheets 3 hour exam solving and analysing problems, All LOs
	T_		% **Total = 100%**	
Coursework	C1	Formative Exercises Assignment	0% 100% **Total = 100%**	Examples of analysis and modelling Worked examples, analysing and modelling engineering situations, All LOs
Practical	P_		% **Total = 100%**	

Updated by:	**Date:**	**Approved by:**	**Date:**
Peter Thorpe	19/01/16	HE Operations (Amanda Crowle)	04/08/16

Recommended Texts and Sources:

Attenborough, M., (2003). *Mathematics for Electrical Engineering and Computing*. Oxford: Newnes
Bird, J., (2004). *Higher Engineering Mathematics*. 4th. ed. Oxford: Newnes
Bolton, W., (2000). *Mathematics for Engineering*. 2nd ed Oxford. Newnes.
Cox, B., (2001). *Understanding Engineering Mathematics*. Oxford: Newnes.
Croft, Davis, Hargreaves, (1995). *Introduction to Engineering Mathematics*, Harlow: Addison-Wesley.
Fox, H., Bolton, W., (2002) *Mathematics for Engineers and Technologists*. Oxford: Newnes.
James, Glyn , (1996). *Modern Engineering Mathematics*. Harlow: Addison-Wesley.
Mustoe, L.R. (1997) *Engineering Mathematics*, Longman

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

MODULE CODE: **CORC2222**	**MODULE TITLE:** **Engineering Project**

CREDITS: 20	**FHEQ Level: 5**	**JACS CODE: H100**

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

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module allows students to undertake a sizeable project in engineering in a planned and managed way. This individual project will be work-based, providing an opportunity for students to focus on the chosen area of specialisation.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***					
WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**%**	**C1** (Coursework)	**80%**	**P1** (Practical)	**20%**
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

SUBJECT ASSESSMENT PANEL Group to which module should be linked: Camborne - Engineering

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To provide a means of applying project management and all the course skills to the solution of a real-life engineering problem. To link design technological, organisational, management and communication skills and the achievement of a practical goal.

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

1. Reflect on personal skills in relation to the solution of a work-based problem.
2. Investigate and develop a solution using project management methods and techniques.
3. Demonstrate initiative and creativity in formulating, completing and reporting on a piece of work.
4. Plan, management, complete and report on their own project.

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	01 Sep 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

SECTION B: DETAILS OF TEACHING, LEARNING AND ASSESSMENT

ACADEMIC YEAR: **2017 - 2018**	NATIONAL COST CENTRE: **115**

MODULE LEADER: **Dr Richard Randall**	OTHER MODULE STAFF: **None**

SUMMARY of MODULE CONTENT

Analysis and specification of the problem to be solved. Planning and scheduling a work programme. Performance, determination of the information required and acquiring it by whatever means are necessary. Evaluation, appraisal and evaluation of the methods used for the outcomes. Communications record and communicate information, ultimately on conclusion to senior organisation management.

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

Scheduled Activities	Hours	Comments/Additional Information
Lectures	20	Core material on project management, research methods and analysis techniques
Supervised Research	60	Weekly meetings with project tutor and technician support staff
Guided Independent Study	120	Students are expected to put in additional time outside of taught sessions
Total	**200**	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	*Element*	*Component Name*	*Component Weighting*	*Comments include links to learning objectives*
Written exam	E_		% **Total = 100%**	
	T_		% **Total = 100%**	
Coursework	C**1**	Formative Project plan Project report	0% 10% 70% **Total = 100%**	Work activities with placement company Present project plan to peers and tutor, Written report presenting findings of the project, LO 3 & 4
Practical	P**1**	Project presentation	20% **Total = 100%**	Present project to peers, LO 2 LO1

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	19/01/16	HE Operations (Amanda Crowle)	04/08/16

Recommended Texts and Sources:

Berry, R. (2004). *The research project: how to write it.* 5th edn. London: Routledge. (Routledge study guides).
Burke, R. (2013). *Project management: planning and control techniques*. 5th edn. Chichester: John Wiley & Sons Ltd.
Field, A.P. (2003). How to design and report experiments. London: Sage.
Lock, D. (2003). *Project Management*, 8th ed, Aldershot: Gower Publishing
Smith, N.J. (2007). *Engineering project management.* 3rd edn. Oxford: Blackwell Publishing.
Smith, K. (2006). *Project Management and Teamwork*, McGraw Hill

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

MODULE CODE: **CORC2223**	**MODULE TITLE:** **Engineering Science 2**

CREDITS: 20	**FHEQ Level: 5**	**JACS CODE: H300**

PRE-REQUISITES: CORC 194	**CO-REQUISITES: No**	**COMPENSATABLE: Yes**

SHORT MODULE DESCRIPTOR: *(max 425 characters)*
This module builds on the learning from Engineering Science 1, providing further, more in-depth investigation of the scientific principles which underpin the design, development and operation of mechanical engineering systems.

ELEMENTS OF ASSESSMENT ***Use HESA KIS definitions]***

WRITTEN EXAMINATION		COURSEWORK		PRACTICAL	
E1 (Examination)	**50%**	**C1** (Coursework)	**50%**	**P1** (Practical)	**%** or Pass/Fail (delete as appropriate)
E2 (Clinical Examination)	**%**	**A1** (Generic Assessment)	**%**		
T1 (Test)	**%**				

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

Professional body minimum pass mark requirement: N/A

MODULE AIMS:
To provide a wider range of study to support the learners' required knowledge and problem-solving skills to support additional study within a specialist area of engineering.

ASSESSED LEARNING OUTCOMES: (additional guidance below)

1. At the end of the module the learner will be expected to be able to:
2. Demonstrate an ability to apply the principles of mechanics of solids to the solution of problems in engineering materials.
3. Investigate the principles of thermodynamics in relation to the design and operation of engineering machines and systems.
4. Analyse the mechanics of fluids interacting with engineering structures, processes and machines.
5. Demonstrate a critical understanding of the generation, distribution and use of electrical power.

DATE OF APPROVAL:	22 April 2016	**FACULTY/OFFICE:**	Academic Partnerships
DATE OF IMPLEMENTATION:	Sept 2016	**SCHOOL/PARTNER:**	Cornwall College
DATE(S) OF APPROVED CHANGE:		**TERM/SEMESTER:**	All Year

Additional notes (for office use only):

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: 2017 - 2018	**NATIONAL COST CENTRE: 115**

MODULE LEADER: Dr Richard Randall	**OTHER MODULE STAFF: None**

SUMMARY of MODULE CONTENT

1. Mechanics of solids – theories of material failure, complex stress & strain, yield criteria.
2. Electrical power – generation, switching and motors
3. Thermodynamics – laws of thermodynamics, reversibility and entropy
4. Fluid mechanics – hydrostatics, fluid flow and fluid momentum

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

Scheduled Activities	Hours	Comments/Additional Information
Lessons	50	Presentation of engineering science theory with the solution of engineering problems.
Practical Classes and Workshops	10	Practical exercises complementing the class lessons.
Guided Independent Study	140	Self-directed study investigating the application of engineering science.
Total	**200**	(NB: 1 credit = 10 hours or learning; 10 credits = 100 hours, etc)

Category	*Element*	*Component Name*	*Component Weighting*	*Comments include links to learning objectives*
Written exam	E1	Formative Exercises Examination	0% 100% **Total = 100%**	Problem-solving worksheets Three hour exam solving engineering problems covering LO 1 and 2
	T		% **Total = 100%**	
Coursework	C1	Formative Discussion Assignment	0% 100% **Total = 100%**	Discussion of thermo-fluid plant and systems Technical report detailing the investigation and analysis of a thermo-fluid engineering system, covering LO 3 and 4
Practical	P		% **Total = 100%**	

Updated by:	**Date:**	**Approved by:**	**Date:**
Dave John	5/05/16	Amanda Crowle	4/8/16

Recommended Texts and Sources:

Bird J. and Ross C. (2014). *Mechanical Engineering Principles* Routledge
Bird J. (2013). *Electrical Circuit Theory & Technology*. Routledge
Bolton, W. (2006). *Engineering science*. 5th edn. Oxford: Newnes.
Cengel Y.A. and Boles M.A. (2011) *Thermodynamics: an engineering approach.* New York: McGraw Hill
Douglas J.F., Gasiorek, J.M., Swaffield, J.A. and Jack, L.B. (2005). *Fluid mechanics.* Harlow: Pearson