

**PROGRAMME DETAILS:**

**MODULES AND RESOURCES**

**Programme Title:** HNC Marine Engineering

**Partner Institution:** Cornwall College at Falmouth Marine School

**Start Date:** September 2014

**First Date of Award:** July 2016 (Part time only)

**Date(s) of Revision(s) to this Document:** Not Applicable

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# PROGRAMME DETAILS: MODULES AND RESOURCES

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| **FHEQ Level:** 4  **For:** HNC Marine Engineering | | | | | | | | |
| **P/T Route Year** | **Structure as Agreed at Programme Approval** | | | | | **Current Revised Structure (if appropriate)** | | |
| **Core or Option Module** | **Credits** | **Module Code** | **Term** | **Module title** | **Core or Option Module** | **Credits** | **Module** |
| 1 | Core | 20 | CORF143 | AY | Analytical Methods | N/A | N/A | N/A |
| 1 | Core | 20 | CORF144 | AY | Engineering Science | N/A | N/A | N/A |
| 1 | Option | 20 | CORF146 | AY | Project Management | N/A | N/A | N/A |
| 1 | Option | 20 | CORF147 | AY | Pneumatic and Hydraulic Systems Design and Management | N/A | N/A | N/A |
| 1 | Option | 20 | CORF148 | AY | 3-D Computer Aided Design | N/A | N/A | N/A |
| 1 | Option | 20 | CORF153 | AY | Marine Control and Instrumentation Systems | N/A | N/A | N/A |
| Year One totals 60 credits | | |  |  |  |  |  |  |
| 2 | Core | 20 | CORF145 | AY | Naval Architecture | N/A | N/A | N/A |
| 2 | Option | 20 | CORF151 | AY | Engineering Business Management Techniques | N/A | N/A | N/A |
| 2 | Option | 20 | CORF152 | AY | Marine Composite Materials | N/A | N/A | N/A |
| 2 | Option | 20 | CORF154 | AY | Work-based Experience | N/A | N/A | N/A |
| Year Two totals 60 credits | | |  | |  |  |  |  |

Students will be required to undertake 60 credits per academic year, totalling 120 credits over the two-year programme.

# Optional modules are to be selected on enrolment in agreement with the Programme Manager. These modules will be delivered on a blended learning basis which will be discussed with the student at admissions stage.

# PD2. Module Records

**SECTION A: DEFINITIVE MODULE RECORD.**

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| **MODULE CODE:** CORF143 | **MODULE TITLE:** Analytical Methods |

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| **CREDITS:** 20 | **FHEQ Level:** 4 | **JACS CODE:** H100 |
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| **PRE-REQUISITE:** None | **CO-REQUISITES:** None | **COMPENSATABLE:** No |

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| **SHORT MODULE DESCRIPTOR:**  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. |

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| **ELEMENTS OF ASSESSMENT** | | | | | |
| WRITTEN EXAMINATION | | COURSEWORK | | PRACTICE | |
| **E1** (formally scheduled) |  | **C1** | 70**%** | **P1** |  |
| **E2** (OSCE) |  | **C2** |  | **P3** |  |
| **T1** (in-class test) | 30**%** | **A1** |  |  |  |

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| **SUBJECT ASSESSMENT PANEL Group to which module should be linked:** Falmouth Marine School |

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| **Professional body minimum pass mark requirement:** N/A |

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| **MODULE AIMS:**  To 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. |

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| **ASSESSED LEARNING OUTCOMES:**  At the end of the module the learner will be expected to be able to:   1. Evaluate a range of engineering problems using algebraic and trigonometric methods. 2. Analyse and model engineering situations and solve problems using the calculus 3. Apply statistics and probability in analysing data sets |

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| **DATE OF APPROVAL:** | 20/05/14 | **FACULTY/OFFICE:** | Academic Partnerships |
| **DATE OF IMPLEMENTATION:** | 01/09/14 | **SCHOOL/PARTNER:** | Cornwall College |
| **DATE(S) OF APPROVED CHANGE:** | N/A | **TERM:** | 14/AY/AU/M |

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| **Additional notes (for office use only):** |

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

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| **ACADEMIC YEAR:** 2014/15 | **NATIONAL COST CENTRE:** 115 |

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| **MODULE LEADER:** Peter Thorpe | **OTHER MODULE STAFF:** |

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| **SUMMARY of MODULE CONTENT**  Algebraic methods; Exponential, trigonometric and hyperbolic functions; Arithmetic and geometric; Power series; Trigonometric methods; Sinusoidal functions; Trigonometric identities; Introduction to differentiation, further integration, applications of calculus; Statistics and probability, tabular and graphical form, central tendency and dispersion, regression, linear correlation, probability, probability distributions. |

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| **SUMMARY OF TEACHING AND LEARNING** | | |
| **Scheduled Activities** | **Hours** | **Comments/Additional Information** |
| Lectures | 50 | Core Material |
| Tutorial | 10 | Assessment support |
| Guided independent study | 140 | Students are expected to put in time outside of taught sessions working on formative assessment materials, research and development |
| **Total** | **200** |  |

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| ***Category*** | ***Element*** | ***Component Name*** | ***Component Weighting*** | ***Comments include links to learning objectives*** |
| Written exam | E1 |  |  |  |
| T1 | In class test | 100%  **Total = 100%** | Apply statistics and probability in analysing data sets |
| Coursework | C1 | Report | 50%  50%  **Total = 100%** | Worked assessment - solve problems using algebraic and trigonometric methods  Worked assessment – solve problems using calculus |

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| **Updated by:** | **Date:** | **Approved by:** | **Date:** |

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| **Recommended Texts and Sources:**  K.A. Stroud and Dexter J. Booth, (2007). Engineering Mathematics. 6th ed. Palgrave Macmillan  Bird, J., (2010). Engineering Mathematics. 6th. ed. Oxford: Newnes |

**SECTION A: DEFINITIVE MODULE RECORD.**

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| --- | --- |
| **MODULE CODE:** CORF144 | **MODULE TITLE:** Engineering Science |

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| **CREDITS:** 20 | **FHEQ Level:** 4 | **JACS CODE:** H100 |
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| **PRE-REQUISITE:** None | **CO-REQUISITES:** None | **COMPENSATABLE:** No |

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| **SHORT MODULE DESCRIPTOR:**  This module investigates a number of major scientific principles, which underpin the design and operation of engineering systems, to cover both static and dynamic mechanical systems and both AC and DC electrical principles |

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| **ELEMENTS OF ASSESSMENT** | | | | | |
| WRITTEN EXAMINATION | | COURSEWORK | | PRACTICE | |
| **E1** (formally scheduled) |  | **C1** | 70**%** | **P1** |  |
| **E2** (OSCE) |  | **C2** |  | **P3** |  |
| **T1** (in-class test) | 30% | **A1** |  |  |  |

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| **SUBJECT ASSESSMENT PANEL Group to which module should be linked:** Falmouth Marine School |

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| **Professional body minimum pass mark requirement:** N/A |

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

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| **ASSESSED LEARNING OUTCOMES:**  At the end of the module the learner will be expected to be able to:   1. Determine the behavioural characteristics of elements of static engineering systems 2. Determine the behavioural characteristics of elements of dynamic engineering systems 3. Apply DC theory to solve electrical and electronic engineering problems 4. Apply single phase AC theory to solve electrical and electronic engineering problems. |

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| **DATE OF APPROVAL:** | 20/05/14 | **FACULTY/OFFICE:** | Academic Partnerships |
| **DATE OF IMPLEMENTATION:** | 01/09/14 | **SCHOOL/PARTNER:** | Cornwall College |
| **DATE(S) OF APPROVED CHANGE:** | N/A | **TERM:** | 14/AY/AU/M |

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| **Additional notes (for office use only):** |

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

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| **ACADEMIC YEAR:** 2014/15 | **NATIONAL COST CENTRE:** 115 |

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| **MODULE LEADER:** Peter Thorpe | **OTHER MODULE STAFF:** |

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

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| **SUMMARY OF TEACHING AND LEARNING** | | |
| **Scheduled Activities** | **Hours** | **Comments/Additional Information** |
| Lectures | 50 | Core Material |
| Laboratory/ Workshop | 10 | Undertake experiments related to static and dynamic engineering systems and measurement related to simple AC and DC systems |
| Guided independent study | 140 | Students are expected to put in time outside of taught sessions working on formative assessment materials, research and development |
| **Total** | **200** |  |

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| ***Category*** | ***Element*** | ***Component Name*** | ***Component Weighting*** | ***Comments include links to learning objectives*** |
| Written exam | E1 |  |  |  |
| T1 | In class test | 100%  **Total = 100%** | Formulate answers to questions on the fundamental aspects of Engineering Science covering mechanical and electrical theorems |
| Coursework | C1 | Report | 50%  50%  **Total = 100%** | Demonstrates a basic understanding of the concepts of Engineering Science formulating answers to mechanical engineering problems related to dynamics and force (1400 words)  Demonstrates a basic understanding of the concepts of Engineering Science formulating answers to electrical engineering problems related to DC and AC theory (1400 words) |

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| **Updated by:** | **Date:** | **Approved by:** | **Date:** |

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| **Recommended Texts and Sources:**  Bolton, W., (2006). Engineering Science, 5th ed. Oxford: Newnes.  Hughes, E., (2008). Electrical and Electronic Technology, 10th ed. Hemel Hempstead: Prentice Hall. |

**SECTION A: DEFINITIVE MODULE RECORD.**

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| **MODULE CODE:** CORF145 | **MODULE TITLE:** Naval Architecture |

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| **CREDITS:** 20 | **FHEQ Level:** 4 | **JACS CODE:** H500 |
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| **PRE-REQUISITE:** None | **CO-REQUISITES:** None | **COMPENSATABLE:** No |

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| **SHORT MODULE DESCRIPTOR:**  This module enables learners to calculate static stability for small and large angles of heel. Learners will 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. |

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| **ELEMENTS OF ASSESSMENT** | | | | | |
| WRITTEN EXAMINATION | | COURSEWORK | | PRACTICE | |
| **E1** (formally scheduled) |  | **C1** | 70% | **P1** |  |
| **E2** (OSCE) |  | **C2** |  | **P3** |  |
| **T1** (in-class test) | 30% | **A1** |  |  |  |

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| **SUBJECT ASSESSMENT PANEL Group to which module should be linked:** Falmouth Marine School |

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| **Professional body minimum pass mark requirement:** N/A |

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| **MODULE AIMS:**  To provide learners with an understanding of ship static stability calculations, the effects of compartmental flooding, forces and moments on ship structures, ship construction and the analysis of resistance to ship motion. |

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| **ASSESSED LEARNING OUTCOMES:**  At the end of the module the learner will be expected to be able to:  1 Understand ship construction techniques and concepts  2 Understand 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 |

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| **DATE OF APPROVAL:** | 20/05/14 | **FACULTY/OFFICE:** | Academic Partnerships |
| **DATE OF IMPLEMENTATION:** | 01/09/14 | **SCHOOL/PARTNER:** | Cornwall College |
| **DATE(S) OF APPROVED CHANGE:** | N/A | **TERM:** | 15/AY/AU/M |

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| **Additional notes (for office use only):** |

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

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| **ACADEMIC YEAR:** 2015/16 | **NATIONAL COST CENTRE:** 115 |

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| **MODULE LEADER:** Peter Thorpe | **OTHER MODULE STAFF:** |

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| **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 |

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| **SUMMARY OF TEACHING AND LEARNING** | | |
| **Scheduled Activities** | **Hours** | **Comments/Additional Information** |
| Lectures | 50 | Core Material |
| Laboratory/ Workshop | 10 | Undertake analysis of ships trim and stability |
| Guided independent study | 140 | Students are expected to put in time outside of taught sessions working on formative assessment materials, research and development |
| **Total** | **200** |  |

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| ***Category*** | ***Element*** | ***Component Name*** | ***Component Weighting*** | ***Comments include links to learning objectives*** |
| Written exam | E1 |  |  |  |
| T1 | In class test | 100%  **Total 100%** | Perform calculations for the forces acting on ship structures, analyse resistance to ship motion in relation to fuel consumption |
| Coursework | C1 | Report | 100%  **Total = 100%** | Ship construction: Demonstrate and 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 (2800 words) |

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| **Updated by:** | **Date:** | **Approved by:** | **Date:** |

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| **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. * Rawson K.J. and Tupper E.C. (2001); *Basic Ship Theory Volume 1* (5th Ed), Oxford: Butterworth-Heinemann * Rawson K.J. and Tupper E.C. (2001); *Basic Ship Theory Volume 2* (5th Ed), Oxford: Butterworth-Heinemann * Derret D.R. and Barrass C.B. (2006); *Ship Stability for Masters and Mates* (6th Ed), Oxford: Butterworth-Heinemann   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.**

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| **MODULE CODE:** CORF146 | **MODULE TITLE:** Project Management |

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| **CREDITS:** 20 | **FHEQ Level:** 4 | **JACS CODE:** N213 |
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| **PRE-REQUISITE:** None | **CO-REQUISITES:** None | **COMPENSATABLE:** No |

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| **SHORT MODULE DESCRIPTOR:**  The module will enable learners to develop an understanding of what constitutes a project and the role of a project manager. Through study and practical application they will examine the criteria for the success or failure of a project and review the elements involved in project management, termination and appraisal. |

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| **ELEMENTS OF ASSESSMENT** | | | | | |
| WRITTEN EXAMINATION | | COURSEWORK | | PRACTICE | |
| **E1** (formally scheduled) |  | **C1** | 100 **%** | **P1** |  |
| **E2** (OSCE) |  | **C2** |  | **P3** |  |
| **T1** (in-class test) |  | **A1** |  |  |  |

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| **SUBJECT ASSESSMENT PANEL Group to which module should be linked:** Falmouth Marine School |

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| **Professional body minimum pass mark requirement:** N/A |

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| **MODULE AIMS:**  To provide an understanding and experience of project management principles, methodologies, tools and techniques that may be used in industry and the public sector and how quality management is a fundamental area of project development. |

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| **ASSESSED LEARNING OUTCOMES:**  At the end of the module the learner will be expected to be able to:   1. Apply principles of project management 2. Plan a project in terms of organisation, personnel and resources 3. Manage, deliver and review project processes and procedures |

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| **DATE OF APPROVAL:** | 20/05/14 | **FACULTY/OFFICE:** | Academic Partnerships |
| **DATE OF IMPLEMENTATION:** | 01/09/14 | **SCHOOL/PARTNER:** | Cornwall College |
| **DATE(S) OF APPROVED CHANGE:** | N/A | **TERM:** | 14/AY/AU/M |

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| **Additional notes (for office use only):** |

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

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| **ACADEMIC YEAR:** 2014/15 | **NATIONAL COST CENTRE:** 115 |

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| **MODULE LEADER:** Martin Peart | **OTHER MODULE STAFF:** |

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| **SUMMARY of MODULE CONTENT**  Principles of project management: Role of the project manager; operational, time and cost criteria; project execution strategy and the role of the project team; success/failure criteria.  Project management systems: Procedures and processes; knowledge of project information support systems; integrate human and material resources; comparison of project outcome with business objectives  Planning a project: Organisational structure; roles and responsibilities; job descriptions and key roles, project sponsor, user, supporters, stakeholders; monitoring and control; scheduling and resourcing techniques; monitoring performance and progress; measurement against established targets,  Leadership requirements; stages of team development e.g. Belbin’s team roles, motivation, team building, project leadership styles and attributes; delegation of work and responsibility; techniques for dealing with conflict; negotiation skills; chairing meetings |

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| **SUMMARY OF TEACHING AND LEARNING** | | |
| **Scheduled Activities** | **Hours** | **Comments/Additional Information** |
| Lectures | 20 | Core Material |
| Project supervision | 20 | Support and guidance |
| External visits | 20 | Group project work |
| Guided independent study | 140 | Study outside of timetabled sessions. |
| **Total** | **200** |  |

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| ***Category*** | ***Element*** | ***Component Name*** | ***Component Weighting*** | ***Comments include links to learning objectives*** |
| Written exam | E1 |  |  |  |
| T1 |  |  |  |
| Coursework | C1 | Report  Report | 40%  60%  **Total = 100%** | Informative report on principles of Project Management (1600 words)  Project Activity and reflective report (2400 words) |
| Practice | P1 |  |  |  |

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| **Updated by:** | **Date:** | **Approved by:** | **Date:** |

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| **Recommended Texts and Sources:**  BAKER, S. (Author.) and BAKER, K. (Author.) (2000) The complete idiot's guide to project management. 2nd edn. USA: Alpha Books. (The Complete Idiot's Guide To).  LOCK, D. (Author.) (2007) The essentials of project management. 3rd edn. Aldershot: Gower.  NEWTON, R. (Author.) (2006) Project management step by step. Harlow: Prentice Hall Business.  POSNER, K. (Author.) (2008) The Project Management Pocketbook. Management Pocketbook. |

**SECTION A: DEFINITIVE MODULE RECORD**

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| **MODULE CODE:** CORF147 | **MODULE TITLE:** Pneumatic and Hydraulic Systems Design and Management |

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| **CREDITS:** 20 | **FHEQ Level:** 4 | **JACS CODE:** H100 |
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| **PRE-REQUISITES:** None | **CO-REQUISITES:** None | **COMPENSATABLE:** No |

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| **SHORT MODULE DESCRIPTOR:**  This module introduces and extends the learner’s knowledge and understanding of fluid power systems in modern industry. Learners will study pneumatic and hydraulic circuit symbols and diagrams and consider circuit designs. They will also examine the characteristics and selection of components and equipment and evaluate relevant industrial applications of pneumatics and hydraulics. |

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| **ELEMENTS OF ASSESSMENT** | | | | | |
| WRITTEN EXAMINATION | | COURSEWORK | | PRACTICE | |
| **E1** (formally scheduled) |  | **C1** | 100% | **P1** |  |
| **E2** (OSCE) |  | **C2** |  | **P3** |  |
| **T1** (in-class test) |  | **A1** |  |  |  |

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| **SUBJECT ASSESSMENT PANEL Group to which module should be linked:** Falmouth Marine School |

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| **Professional body minimum pass mark requirement:** N/A |

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| **MODULE AIMS:**  This unit aims to extend learners’ understanding of pneumatic and hydraulic fluid power systems and their modern industrial applications and enable them to design fluid power circuits. |

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| **ASSESSED LEARNING OUTCOMES:**  1 Interpret pneumatic and hydraulic fluid power diagrams  2 Apply construction principles to the function and operation of hydraulic components, equipment and plant  3 Design and manage pneumatic circuits |

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| **DATE OF APPROVAL:** | 20/05/14 | **FACULTY/OFFICE:** | Academic Partnerships |
| **DATE OF IMPLEMENTATION:** | 01/09/14 | **SCHOOL/PARTNER:** | Cornwall College |
| **DATE(S) OF APPROVED CHANGE:** | N/A | **TERM:** | 14/AY/AU/M |

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| **Additional notes (for office use only):** |

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

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| **ACADEMIC YEAR:** 2014-15 | **NATIONAL COST CENTRE:** 115 |

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| **MODULE LEADER:** Brian Stretton | **OTHER MODULE STAFF:** |

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| **SUMMARY of MODULE CONTENT**  Pneumatic and hydraulic symbol; use of appropriate British and International Standards e.g. BS 2917, ISO 1219-2 (2009), ISO 9461 (Hydraulics), CETOP, RP68P, ISO 5599 (Pneumatics); Fluid power diagrams; Read and interpret system-layout and circuit diagrams e.g. use of ISO 1219-2 Part 2; Pneumatic equipment; Hydraulic equipment; Performance characteristics; isothermal efficiency; Pneumatic circuits; Hydraulic circuits; Electro-pneumatic and electro-hydraulic circuits; Emergency ‘fail safe’ circuits; |

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| **SUMMARY OF TEACHING AND LEARNING** | | |
| **Scheduled Activities** | **Hours** | **Comments/Additional Information** |
| Lecture | 20 | Core material |
| Project supervision | 20 | Support and guidance |
| Practical classes and workshops | 20 | System design and analysis |
| Guided independent study | 140 | Students are expected to put in time outside of taught sessions working on formative assessment materials, research and development |
| **Total** | **200** |  |

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| ***Category*** | ***Element*** | ***Component Name*** | ***Component Weighting*** | ***Comments include links to learning objectives*** |
| Written exam | E1 |  |  |  |
| T1 |  |  |  |
| Coursework | C1 | Assignment | 40%  60%  Total = 100% | Design, manage and interpret pneumatic and hydraulic fluid power systems (1600 words)  Apply design and construction principles to test the function and operation of hydraulic components, equipment and plant (2400 words) |
| Practice | P1 |  |  |  |

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| **Updated by:** | **Date:** | **Approved by:** | **Date:** |

**SECTION A: DEFINITIVE MODULE RECORD.**

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| --- | --- |
| **MODULE CODE:** CORF148 | **MODULE TITLE:** 3-D Computer Aided Design |

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| **CREDITS:** 20 | **FHEQ Level:** 4 | **JACS CODE:** H130 |
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| **PRE-REQUISITE:** None | **CO-REQUISITES:** None | **COMPENSATABLE:** No |

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| **SHORT MODULE DESCRIPTOR:**  This module will equip the learner with the necessary advanced CAD parametric modelling skills that industry demands to meet the requirements of BS8888:2011. Learners should be able to produce and edit 2D shapes prior to starting this unit. Learners will investigate a CAD software package so as to be able to generate advanced surface and solid models. |

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| **ELEMENTS OF ASSESSMENT** | | | | | |
| WRITTEN EXAMINATION | | COURSEWORK | | PRACTICE | |
| **E1** (formally scheduled) |  | **C1** | 100% | **P1** |  |
| **E2** (OSCE) |  | **C2** |  | **P3** |  |
| **T1** (in-class test) |  | **A1** |  |  |  |

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| **SUBJECT ASSESSMENT PANEL Group to which module should be linked:** Falmouth Marine School |

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| **Professional body minimum pass mark requirement:** N/A |

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| **MODULE AIMS:**  The aim of this unit is to enhance learners’ skills in the use of computer-aided design (CAD) and 3D modelling systems to solve a design problem. |

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| **ASSESSED LEARNING OUTCOMES:**  At the end of the module the learner will be expected to be able to:   1. Generate and manipulate a surface model 2. Generate and manipulate a solid model 3. Analyse a solid model to find mass, radius of gyration, centre of gravity, surface area and volume |

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| **DATE OF APPROVAL:** | 20/05/14 | **FACULTY/OFFICE:** | Academic Partnerships |
| **DATE OF IMPLEMENTATION:** | 01/09/14 | **SCHOOL/PARTNER:** | Cornwall College |
| **DATE(S) OF APPROVED CHANGE:** N/A | N/A | **TERM:** | 14/AY/AU/M |

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| **Additional notes (for office use only):** |

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

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| **ACADEMIC YEAR:** 2014/15 | **NATIONAL COST CENTRE:** 115 |

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| **MODULE LEADER:** Brian Stretton | **OTHER MODULE STAFF:** |

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| **SUMMARY of MODULE CONTENT**  User co-ordinate system to suit required geometry, construct shapes for surfacing, generate bounded geometry and use methods of surface construction with reference to Bezier, Nurbs, Patch and Coons. Test best construction methods and use of Facet numbers required to smooth surface. Use of Hide, Shade and Render to visualise the product; plot finished drawing with use of different textures.  Construct shapes for extruding, solids with the use of subtract, union, intersect extrude, sweep and revolve in model construction; editing the geometry using fillet, chamfer etc. Use of solid model to find the mass, radius of gyration, centre of gravity and surface area and volume. Generate solids, dimension and plot images. |

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| **SUMMARY OF TEACHING AND LEARNING** | | |
| **Scheduled Activities** | **Hours** | **Comments/Additional Information** |
| Lectures | 10 | Core material |
| Demonstration | 10 | Core material |
| Supervised time on workshop | 40 | Assessment support |
| Guided independent study | 140 | Students are expected to put in time outside of taught sessions working on formative assessment materials, research and development |
| **Total** | **200** |  |

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| ***Category*** | ***Element*** | ***Component Name*** | ***Component Weighting*** | ***Comments include links to learning objectives*** |
| Written exam | E1 |  |  |  |
| T1 |  |  |  |
| Coursework | C1 | Assignment 1  Assignment 2  Assignment 3 | 30%  30%  40%  **Total = 100%** | Generate and manipulate a surface model  Generate and manipulate a solid model  Analyse a solid model to find mass, radius of gyration, centre of gravity, surface area and volume |
| Practice | P1 |  |  |  |

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| **Updated by:** | **Date:** | **Approved by:** | **Date:** |

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| **Recommended Texts and Sources:**  LOMBARD, M. (Author.) (2008) Solidworks: surfacing and complex shape modeling bible. Chichester: John Wiley.  LOMBARD, M. (Author.) (2008) Solidworks 2009 bible [CD ROM]. Chichester: John Wiley.  MURRAY, D. (Author.) (2005) Inside solidworks. 4th edn. Thomson Delmar Learning.  PLANCHARD, D.C. (Author.) and PLANCHARD, M.P. (Author.) (2008) Engineering design with Solidworks 2008 and multimedia CD: a step by step project based approach utilizing 3D solid modeling [CD ROM]. Kansas: Schroff Development Corporation. |

**SECTION A: DEFINITIVE MODULE RECORD.**

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| **MODULE CODE:**  CORF151 | **MODULE TITLE**:  Engineering Business Management Techniques |

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| **CREDITS:** 20 | **FHEQ Level:** 4 | **JACS CODE:** N200 |
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| **PRE-REQUISITE:** None | **CO-REQUISITES:** None | **COMPENSATABLE:** No |

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| **SHORT MODULE DESCRIPTOR:**  This module will allow learners to develop an appreciation of business organisations and the application of costing techniques and those key functions that underpin financial planning and control. |

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| **ELEMENTS OF ASSESSMENT** | | | | | |
| WRITTEN EXAMINATION | | COURSEWORK | | PRACTICE | |
| **E1** (formally scheduled) |  | **C1** | 100 **%** | **P1** |  |
| **E2** (OSCE) |  | **C2** |  | **P3** |  |
| **T1** (in-class test) |  | **A1** |  |  |  |

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| **SUBJECT ASSESSMENT PANEL Group to which module should be linked:** Falmouth Marine School |

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| **Professional body minimum pass mark requirement:** N/A |

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| **MODULE AIMS:**  To allow learners to develop an appreciation of business organisations and the application of costing techniques and those key functions that underpin financial planning and control. |

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| **ASSESSED LEARNING OUTCOMES:**  At the end of the module the learner will be expected to be able to:   1. Demonstrate an understanding of the role, operation and application of business management within an engineering company 2. Select and apply costing systems and techniques 3. Apply the key functions of financial planning and control 4. Apply project planning and scheduling methods to an engineering project |

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| **DATE OF APPROVAL:** | 20/05/14 | **FACULTY/OFFICE:** | Academic Partnerships |
| **DATE OF IMPLEMENTATION:** | 01/09/14 | **SCHOOL/PARTNER:** | Cornwall College |
| **DATE(S) OF APPROVED CHANGE:** | N/A | **TERM:** | 15/AY/AU/M |

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| **Additional notes (for office use only):** |

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

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| **ACADEMIC YEAR:** 2015/16 | **NATIONAL COST CENTRE:** 115 |

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| **MODULE LEADER:** Martin Peart | **OTHER MODULE STAFF:** |

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| **SUMMARY of MODULE CONTENT**  Engineering business function and organisation; management and operational structures in general engineering companies; product design, manufacture and delivery; quality assurance control; Financial planning process, Factors influencing decisions, cash and working capital management, budgetary planning, capital control, cash flow, causes of variance, budgetary slack; Business planning and management; production planning; management of work activities; just-in-time methods; value-added chains; statistical process control; job costing, process costing, contract costing techniques; profitability forecast, contribution analysis, ‘what if’ analysis; Key functions of financial planning and control; Financial planning process: short, medium and long-term plans; strategic plans; operational planning |

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| **SUMMARY OF TEACHING AND LEARNING** | | |
| **Scheduled Activities** | **Hours** | **Comments/Additional Information** |
| Lectures | 20 | Core Material |
| External visits | 20 | Core Material |
| Project supervision | 20 | Support and guidance |
| Guided independent study | 140 | Outside of normal timetabled sessions |
| **Total** | **200** |  |

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| ***Category*** | ***Element*** | ***Component Name*** | ***Component Weighting*** | ***Comments include links to learning objectives*** |
| Written exam | E1 |  |  |  |
| T1 |  |  |  |
| Coursework | C1 | Report  Report | 50%  50%  **Total = 100%** | A written report, which demonstrates an understanding of the concepts of a business management and shows awareness of the financial and ethical issues involved. (2000 words)  A written report to demonstrate working with the costing and budgetary requirements of small projects and production quotas. (2000 words) |
| Practice | P1 |  |  |  |

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| **Updated by:** | **Date:** | **Approved by:** | **Date:** |

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| **Recommended Texts and Sources:**  BESTERFIELD, D.H. (Author.) et al. (2003) Total quality management. 3rd edn. New Jersey: Prentice-Hall International.  DALE, B.G. (Author.), VAN DER WIELE, T. (Author.) and VAN IWAARDEN, J. (Author.) (2007) Managing quality. 5th edn. Oxford: Blackwell  HEIZER, J. (Author.) and RENDER, B. (Author.) (2010) Operations Management. 10th edn. Pearson.  HEIZER, J. (Author.) and RENDER, B. (Author.) (2014) Operations management: sustainability and supply chain management. 11th edn. Harlow: Pearson Education Limited. |

**SECTION A: DEFINITIVE MODULE RECORD.**

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| **MODULE CODE:**  CORF152 | **MODULE TITLE**:  Marine Composite Materials |

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| **CREDITS:** 20 | **FHEQ Level:** 4 | **JACS CODE:** J511 |
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| **PRE-REQUISITE:** None | **CO-REQUISITES:** None | **COMPENSATABLE:** No |

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| **SHORT MODULE DESCRIPTOR:**  This module will develop the student’s understanding of the materials and structural properties of materials used in the composite industries, and experience a range of common manufacturing/processing methods |

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| **ELEMENTS OF ASSESSMENT** | | | | | |
| WRITTEN EXAMINATION | | COURSEWORK | | PRACTICE | |
| **E1** (formally scheduled) |  | **C1** | 100 **%** | **P1** |  |
| **E2** (OSCE) |  | **C2** |  | **P3** |  |
| **T1** (in-class test) |  | **A1** |  |  |  |

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| **SUBJECT ASSESSMENT PANEL Group to which module should be linked:** Falmouth Marine School |

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| **Professional body minimum pass mark requirement:** N/A |

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| **MODULE AIMS:**  To develop students understanding of the materials and structural properties of materials used in the composite industries, and experience a range of common manufacturing/processing methods |

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| **ASSESSED LEARNING OUTCOMES:**  At the end of the module the learner will be expected to be able to:   1. Demonstrate an understanding of the application of resin systems, reinforcement fabrics and core materials within open and closed moulding systems 2. Explain the application and benefits of open and closed moulding manufacturing processes 3. Demonstrate the ability and test laminate structures produced in open and closed moulding techniques in monolithic and sandwich construction, taking account of laminate schedules and the use of the rule of mixtures |

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| **DATE OF APPROVAL:** | 20/05/14 | **FACULTY/OFFICE:** | Academic Partnerships |
| **DATE OF IMPLEMENTATION:** | 01/09/14 | **SCHOOL/PARTNER:** | Cornwall College |
| **DATE(S) OF APPROVED CHANGE:** | N/A | **TERM:** | 15/AY/AU/M |

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| **Additional notes (for office use only):** |

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

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| **ACADEMIC YEAR:** 2015/16 | **NATIONAL COST CENTRE:** 115 |

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| **MODULE LEADER:** Martin Peart | **OTHER MODULE STAFF:** |

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| **SUMMARY of MODULE CONTENT**  Health & Safety; SIMPL - Safety in Manufacturing Plastics Health and Safety Initiative  Reinforcement types and weaves; Core material types; Resin systems; Structural properties; Laminate schedules; rule of mixtures  Monolithic and sandwich laminates; Male/female moulds; Open/closed moulding systems  Testing; tensile stress, flexural stress, Barcol hardness, face to core bonding; destructive and non-destructive evaluation |

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| **SUMMARY OF TEACHING AND LEARNING** | | |
| **Scheduled Activities** | **Hours** | **Comments/Additional Information** |
| Lectures | 20 | Core Material |
| Practical classes and workshops | 20 | Open and closed moulding techniques and testing |
| Demonstrations | 20 | Core material |
| Guided independent study | 140 | 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** |  |

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| ***Category*** | ***Element*** | ***Component Name*** | ***Component Weighting*** | ***Comments include links to learning objectives*** |
| Written exam | E1 |  |  |  |
| T1 |  |  |  |
| Coursework | C1 | Report  Report | 50 %  50 %  **Total = 100%** | Describe application of resin systems, reinforcement fabrics, core materials, open and closed mould manufacturing processes and the health and safety benefits of each system (2000 words)  Evaluation and analysis of practical activity in testing moulding processes (2000 words) |

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| **Updated by:** | **Date:** | **Approved by:** | **Date:** |

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| **Recommended Texts and Sources:**  BARBERO, E.J. (Author.) (2011) Introduction to composite materials design. 2nd edn. Boca Raton: CRC.  Manufacturing materials and processes: composite materials - Part A (2004) [DVD]. Classroom Video Ltd.  Manufacturing materials and processes: composite materials - part B (2004) [DVD]. Classroom Video Ltd.  RNLI (2009) Why Composite? [DVD]. RNLI.  BAILLIE, C. (Author.) (2004) Green composites: polymer composites and the environment [eBook].  GURIT systems: http://www.gurit.com/products-and-materials.aspx |

**SECTION A: DEFINITIVE MODULE RECORD.**

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| **MODULE CODE:**  CORF153 | **MODULE TITLE**:  Marine Control and Instrumentation Systems |

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| **CREDITS:** 20 | **FHEQ Level:** 4 | **JACS CODE:** H660 |
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| **PRE-REQUISITE:** None | **CO-REQUISITES:** None | **COMPENSATABLE:** No |

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| **SHORT MODULE DESCRIPTOR:**  To develop the learners understanding of the development and integration of control and instrumentation systems equipment into private and commercial vessels |

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| **ELEMENTS OF ASSESSMENT** | | | | | |
| WRITTEN EXAMINATION | | COURSEWORK | | PRACTICE | |
| **E1** (formally scheduled) |  | **C1** | 100 **%** | **P1** |  |
| **E2** (OSCE) |  | **C2** |  | **P3** |  |
| **T1** (in-class test) |  | **A1** |  |  |  |

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| **SUBJECT ASSESSMENT PANEL Group to which module should be linked:** Falmouth Marine School |

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| **Professional body minimum pass mark requirement:** N/A |

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| **MODULE AIMS:**   * To develop students understanding of the integration of distributed control systems on board marine vessels in the sensing, measurement, control and communication of data required for the safe operation of shipboard mechanical and electrical systems |

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| **ASSESSED LEARNING OUTCOMES:**  At the end of the module the learner will be expected to be able to:   1. Describe distributed control systems on board marine vessels 2. Describe mechanical and electrical sensing and control systems 3. Analyse network communication systems 4. Apply basic fault finding techniques to sensing and control systems |

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| **DATE OF APPROVAL:** | 20/05/14 | **FACULTY/OFFICE:** | Academic Partnerships |
| **DATE OF IMPLEMENTATION:** | 01/09/14 | **SCHOOL/PARTNER:** | Cornwall College |
| **DATE(S) OF APPROVED CHANGE:** | N/A | **TERM:** | 14/AY/AU/M |

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| **Additional notes (for office use only):** |

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

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| **ACADEMIC YEAR:** 2015/16 | **NATIONAL COST CENTRE:** 115 |

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| **MODULE LEADER:** Martin Peart | **OTHER MODULE STAFF:** |

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| **SUMMARY of MODULE CONTENT**  Introduction to distributed controls on board marine vessels, component sub-system control, computerised control system, network communication and monitoring of mechanical and electrical control systems  Mechanical control systems; Programmable Logic Controllers – purpose and functions on board, Hydraulic controls for large motor and sailing vessels. Electrical control systems; Variable frequency drives, soft start drives; Generator controls, Electronic speed governors, synchronization systems, load sharing systems, load shedding considerations, protection measures. Measurement and sensor interfacing e.g. Thermocouples vs. RTDs, tank level sensing methods; Monitoring, control and alarm systems. Controller networks primer: ASi, Ethernet, ARCNet, MODBUS. Present and future communications standards on board for interoperability e.g. OneNet. |

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| **SUMMARY OF TEACHING AND LEARNING** | | |
| **Scheduled Activities** | **Hours** | **Comments/Additional Information** |
| Lectures | 40 | Core Material |
| Laboratory/ Workshop | 20 | integration and distribution of control systems |
| Guided independent study | 140 | 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** |  |

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| ***Category*** | ***Element*** | ***Component Name*** | ***Component Weighting*** | ***Comments include links to learning objectives*** |
| Coursework | C1 | Report  Report | 60%  40%  **Total = 100%** | Analyse and describe the purpose and function of mechanical and electrical control systems as applied to marine vessels (2400 words)  Analyse and describe current and future control networks and communication standards as applied to marine vessels (1600 words) |

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| **Updated by:** | **Date:** | **Approved by:** | **Date:** |

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| **Recommended Texts and Sources:**  BACON, J. (Author.) (2003) *Concurrent systems: An integrated approach to operating systems, distributed systems and databases*. 3rd edn. Essex: Pearson Education Limited. (Open University).  BOLTON, W. (Author.) (2003) *Mechatronics: electronic control systems in mechanical and electrical engineering*. 3rd edn. Essex: Pearson.  CHOWDHURY, S. (Author.), CHOWDHURY, S.P. (Author.) and CROSSLEY, P. (Author.) (2009) *Microgrids and active distribution networks*. Stevenage, Herts: Institute of Engineering and Technology.  Couch L, (Author.) (2013) *Digital & Analog Communication Systems*, University of Florida: Prentice Hall  ENGLISH, J. (Author.) (2004) *Introduction to Operating Systems*. Basingstoke: Palgrave Macmillan.  ELECTRONICS, W. (Author.) (2012) *CD Multisim : schematic capture, simulation and programmable logic (single user licence)* [CD ROM]. Electronics Workbench. |

**SECTION A: DEFINITIVE MODULE RECORD.**

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| **MODULE CODE:**  CORF154 | **MODULE TITLE**:  Work-based Experience |

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| **CREDITS:** 20 | **FHEQ Level:** 4 | **JACS CODE:** X900 |
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| **PRE-REQUISITE:** None | **CO-REQUISITES:** None | **COMPENSATABLE:** No |

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| **SHORT MODULE DESCRIPTOR:**  This module requires the learner to have the opportunity to undertake a significant professional development activity within the workplace and is intended to allow learners to plan, undertake, evaluate and reflect upon such activity and the benefit that such activity brings to their professional development within the industry. |

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| **ELEMENTS OF ASSESSMENT** | | | | | |
| WRITTEN EXAMINATION | | COURSEWORK | | PRACTICE | |
| **E1** (formally scheduled) |  | **C1** | 100 **%** | **P1** |  |
| **E2** (OSCE) |  | **C2** |  | **P3** |  |
| **T1** (in-class test) |  | **A1** |  |  |  |

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| **SUBJECT ASSESSMENT PANEL Group to which module should be linked:** Falmouth Marine School |

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| **Professional body minimum pass mark requirement:** N/A |

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| **MODULE AIMS:**   * To enable learners to experience and analyse the scope and depth of learning to take place in a work-based context by planning, monitoring and evaluating the work experience |

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| **ASSESSED LEARNING OUTCOMES:**  At the end of the module the learner will be expected to be able to:   1. Demonstrate the ability to negotiate and organise industry work based professional development activity 2. Analyse the specific requirements of the professional development activity 3. Complete the activity, monitoring and evaluate their own performance and development |

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| **DATE OF APPROVAL:** | 20/05/14 | **FACULTY/OFFICE:** | Academic Partnerships |
| **DATE OF IMPLEMENTATION:** | 01/09/14 | **SCHOOL/PARTNER:** | Cornwall College |
| **DATE(S) OF APPROVED CHANGE:** | N/A | **TERM:** | 14/AY/AU/M |

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| **Additional notes (for office use only):** |

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

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| **ACADEMIC YEAR:** 2014-2015 | **NATIONAL COST CENTRE:** 115 |

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| **MODULE LEADER:** Martin Peart | **OTHER MODULE STAFF:** |

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| **SUMMARY of MODULE CONTENT**  Negotiation of industry work based professional development:*Suitability of organisation, location and activity; methods of negotiation; nature of duties, role and responsibilities of mentors, expectations of learning, business constraints.*  Analyse the specific requirements: *Tasks*, details of activities; *Prioritise tasks and activities*; *Planning for the work experience*; *Benefits to organisation and learner*:  Undertake work experience: *Carry out the planned activities*; *Record activities; Revise activities and outcomes as appropriate.*  Monitor and evaluate performance and learning: *Evaluation of the quality of the work undertaken*; *Evaluation of learning during the work experience*; *Recommendations on how the learning experience could have been enhanced*. |

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| **SUMMARY OF TEACHING AND LEARNING** | | |
| **Scheduled Activities** | **Hours** | **Comments/Additional Information** |
| Lectures | 10 | Core Material |
| Tutorials | 10 | Planning of professional development activities |
| Work-based learning | 40 | Attendance at work placement |
| Guided independent study | 140 | 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** |  |

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| ***Category*** | ***Element*** | ***Component Name*** | ***Component Weighting*** | ***Comments include links to learning objectives*** |
| Written exam | E1 |  |  |  |
| T1 |  |  |  |
| Coursework | C1 | Report  Report | 20%  80%  **Total = 100%** | Reflective report to meet the requirements of Learning Outcome 1 (800 words)  Reflective report on the activity undertaken, the development of their learning and the benefits of the activity undertaken for the organisation and the individual (3200 words) |

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| **Updated by:** | **Date:** | **Approved by:** | **Date:** |

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| **Recommended Texts and Sources:**  HEMMINGS, M. (Author.) (no date) *Work related learning*. Milton Keynes: Chalkface Project.  Durrant, A. Rhodes, G. Young (Eds). 2009. *Getting started with university level work related learning.* London: Middlesex University Press. |

# PD3. Staffing and Resources

It is respected that programme management and staffing is the remit of the partner institution; however in order to align staffing and resources with standards and quality it is first necessary to define the expected requirements of each.

**Quantifying expectations for staffing:**

When all stages of the programme are delivered, an approximate minimum of three members of teaching staff are considered appropriate for managing the programme and module leadership roles. Proportionally this equates to an approximate one full time equivalent member of staff.

**Qualifying the knowledge, skills and attributes base expectations for staffing, and resources/facilities:**

The diet of study outlined in the programme structure (section PS12 and PD1) and detailed within the modules (section PD2) requires a breadth of knowledge, skills and attribute sets within the body of teaching staff along with resources and facilities. Post approval, it would be normal for a programme to experience staff changes and resource changes over time. It is therefore important to clarify the skills set required for delivering the programme and modules are appropriately maintained. This is not only of benefit for programme leaders and module leaders but also for institutions when considering staff recruitment and/or resourcing.

**Defining the minimum staff skill sets required across the programme as a whole:**

With the focus of the course being industry based, it is anticipated that staff will hold an appropriate academic qualification (Level 5 minimum) and have proven experience within the industry. Staff will also be expected to be up to date with relevant industrial continuous professional development.

**Defining the minimum staff skill sets and resourcing required across each module:**

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| **Module Code and Title:** | **Essential Staff Qualifications and Experience** | **Resources / Facilities** | **Additional Skills Sets** |
| Analytical Methods | Minimum of a Level 5 qualification in an appropriate engineering qualification area (HND Engineering)  Relevant teaching / lecturing qualification | Appropriate reference material  Appropriate industry based contacts  Appropriate industry based experience  Specialist software i.e. Excel or similar | Numeracy Skills  Communication skills  IT skills  Practical engineering experience |
| Engineering Science | Minimum of a Level 5 qualification in an appropriate engineering qualification area (HND Engineering)  Relevant teaching / lecturing qualification | Appropriate reference material  Appropriate industry based contacts  Appropriate industry based experience  Specialist software i.e. Excel or similar | Numeracy Skills  Communication skills  IT skills  Practical engineering experience |
| Naval Architecture | Minimum of a Level 5 qualification in an appropriate marine related qualification area (HND Marine Engineering) or relevant maritime industry experience  Relevant teaching / lecturing qualification | Appropriate reference material  Appropriate marine industry based contacts  Appropriate marine industry based experience  Ship/ dry dock visits | Numeracy Skills  Communication skills  IT skills  Practical engineering experience |
| Project Management | Minimum of a Level 5 qualification in an appropriate engineering or Business Management subject area or relevant industry experience in quality and project management  Relevant teaching / lecturing qualification | Appropriate reference material  Appropriate marine industry based contacts  Appropriate marine industry based experience | Numeracy Skills  Communication skills  IT skills  Practical engineering experience |
| Pneumatic and Hydraulic Systems Design and Management | Minimum of a Level 5 qualification in an appropriate engineering subject area (HND Engineering) or relevant industry experience in the managing and design of similar systems  Relevant teaching / lecturing qualification | Appropriate reference material  Appropriate industry based contacts  Appropriate industry based experience  Specialist workshop facilities/ Pneumatic/ Hydraulic systems | Numeracy Skills  Communication skills  IT skills  Practical engineering experience  Pneumatic/ Hydraulic systems experience |
| Advanced Computer Aided Design | Minimum of a Level 5 qualification in an appropriate engineering or design subject area (HND Engineering) or relevant industry experience in the managing and use of similar Computer Aided design systems  Relevant teaching / lecturing qualification | Appropriate reference material  Appropriate industry based contacts  Appropriate industry based experience  Specialist software i.e. AutoCAD/ Solid Works | Numeracy Skills  Communication skills  IT skills  Practical engineering experience  Relevant CAD experience |
| Marine Control and Instrumentation Systems | Minimum of a Level 5 qualification in an appropriate engineering subject area (HND Controls related module) or relevant industry experience in managing plant and process control systems  Relevant teaching / lecturing qualification | Appropriate reference material  Appropriate industry based contacts  Appropriate industry based experience  Specialist workshop equipment | Numeracy Skills  Communication skills  IT skills  Practical engineering experience |
| Work Based Experience | Minimum of a Level 5 qualification in an appropriate engineering subject area (HND Engineering) or relevant industry experience in Project management  Relevant teaching / lecturing qualification | Appropriate reference material  Appropriate industry based contacts  Appropriate industry based experience  Work place Project desirable | Numeracy Skills  Communication skills  IT skills  Practical engineering experience |
| Engineering Business Management Techniques | Minimum of a Level 5 qualification in an appropriate engineering subject area (HND Engineering) or relevant industry experience in Business management  Relevant teaching / lecturing qualification | Appropriate reference material  Appropriate industry based contacts  Appropriate industry based experience | Numeracy Skills  Communication skills  IT skills  Practical engineering experience |
| Marine Composite Materials | Minimum of a Level 5 qualification in an appropriate composite materials subject area or relevant industry experience in Composite manufacture  Relevant teaching / lecturing qualification | Appropriate reference material  Appropriate industry based contacts  Appropriate industry based experience  Specialist workshop facilities/ Composite workshop, Ponsharden | Numeracy Skills  Communication skills  IT skills  Practical engineering experience |