

University of Plymouth
Academic Partnerships
CORNWALL COLLEGE
CAMBORNE
Programme Specification
HNC Engineering
Academic Year 2022-2023



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

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Please note:

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

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PROGRAMME SPECIFICATION

Programme Title: HNC Engineering

Programme Code: Part Time - 5917

Partner Delivering Institution: Cornwall College, Camborne

Start Date: September 2022-2023

First Award Date: Part Time – 2024-25

Date of Approval: 22nd April 2016

**Date(s) of Revision(s) to this Document: 3rd March 2016/ 4th August 2016/
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PS1. Programme Details

Awarding Institution:	University of Plymouth
Partner Institution and delivery site (s):	Cornwall College
Accrediting Body:	N/A
Language of Study:	English
Mode of Study:	Part-time
Final Award:	HNC Engineering
Intermediate Award:	N/A
Programme Title:	HNC Engineering
UCAS Code:	N/A
HECOS Code:	100184
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 (2019)
Date of Programme Approval:	22 April 2016

PS2. Brief Description of the Programme

This HNC is designed to further develop the knowledge and skills of technicians working in the engineering industry. The programme brings together the requirement for technicians to be well versed in engineering principles and also to develop specialist knowledge in an area of their choosing. The programme offers a broad engineering curriculum covering mathematics, engineering science, material science, computer-aided design, manufacturing, automation, control systems, business and an option to study one of the following specialist modules:

- Mechanical Engineering Technology
- Electrical Engineering Technology;
- Marine Engineering Technology;
- Maintenance Engineering Technology;
- Aeronautical Engineering Technology.

Completing the programme will make you more versatile, more knowledgeable, 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://www.plymouth.ac.uk/student-life/your-studies/essential-information/regulations>

None

PS5. Programme Aims

This programme will deliver:

1. A comprehensive learning experience that equips learners with the necessary knowledge, skills and behaviours to excel in their engineering career.
2. A comprehensive curriculum, covering the fundamental principles of engineering with an opportunity to select a specialist module.
3. A vocational study programme that extensively uses the solution of real engineering problems as the basis of the assessment tasks.
4. High level knowledge and skills providing the learner 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:

1. 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.
2. 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 and in formulating design thus working with an appropriate level of detail.
3. 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.
4. Be effective in a range of practical skills such as data collection and analysis, engineering design and development, presentation and written communication skills.

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.
3. Opportunity to study a specialist module aligned to the industry sector the learner is associated with.
4. Problem solving methods and skills are introduced to learners enabling them to develop innovative and robust solutions independently.
5. Organised trips to a range of engineering companies allow students direct access to current technology and the people who apply that technology to engineering problems.

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 HNC Engineering students will be eligible to progress to Stage 2 (Level 5) of the FdSc Engineering at Cornwall College.

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

PS10. Admissions Criteria

Entry Criteria (Qualifications)	Details
Functional Skills	L2 Literacy and L2 Numeracy
GCSE (or equivalent)	Minimum of Grade C/grade 4 in Maths, English Language and Science (if science-based programme)
AS/A Levels	HNC/HND/Fd - 48 UCAS tariff points to include at least 32 points from A2 level in appropriate subjects
BTEC National Diploma/Extended Diploma	HNC/HND/Fd – 48 UCAS tariff points – PPP grades in an appropriate subject
BTEC L3 Diploma	HNC/HND/Fd – 48 UCAS tariff points – MP grades in an appropriate subject
BTEC 90 Credit Diploma/Subsidiary Diploma	HNC/HND/Fd – 48 UCAS tariff points – in an appropriate subject and considered only with combination of other relevant level 3 qualifications
City & Guilds (land based) L3 Diploma	*L3 Diploma - HNC/HND/Fd – 48 UCAS tariff points – M grades in an appropriate subject *Usually accepted in combination with other relevant L3 qualifications
City & Guilds (land based) Extended Diploma	HNC/HND/Fd – 48 UCAS tariff points – P grades in an appropriate subject
City & Guilds (land based) Advanced Technical Extended Diploma	HNC/HND/Fd – 48 UCAS tariff points – PPP grades in an appropriate subject
City & Guilds (land based) Subsidiary Diploma	HNC/HND/Fd – 48 UCAS tariff points – D grades in an appropriate subject
City & Guilds (land based) 90 Credit Diploma	HNC/HND/Fd – 48 UCAS tariff points – M grades in an appropriate subject
Access to HE Diploma	Successful completion of Access to HE Diploma with at least 45 credits at level 3 in an appropriate subject
International Baccalaureate	24 points

Entry Criteria (Qualifications)	Details
Irish/Scottish Highers	HNC/HND/Fd - 48 UCAS tariff points to include at least 32 points from Scottish Advanced Highers/Irish Highers
Other Level 3 qualifications	Will be taken into consideration and dependent upon subject area and number of units studied
Mature Applicants (over 21)	Mature applicants with relevant experience but without the stated entry qualifications will be considered individually at interview
Accreditation of Prior Learning	www.plymouth.ac.uk
Independent Safeguarding Agency (ISA)/Disclosure and Barring Service (DBS) clearance required	No
Capability statement	

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:

Subject External Examiner(s):

External examiners undertake an interim visit, usually between January and February, when they will review completed and marked assessment and gain feedback from current students on their learning experience.

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 and the National Student Survey is administered during the year and feeds into the programme review.

Student Representatives attend Programme Committee Meetings to contribute student views alongside Module Leaders, the Programme Manager and the HE 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, Imerys.

PS12. Programme Structure

College:	Cornwall College Camborne	Programme Title:	HNC Engineering
Academic Year:	2022-2023	Mode of Attendance Course Duration:	Part Time Over 2 Years
Plymouth Programme Code:	5917	Total Credits:	120 Credits at Level 4

FHEQ level: 4 For: HNC Part Time (5917)				
P/T Route Year	When in Year? (I.e. Autumn, Spring etc.)	Core or Option Module	Credits	Module
1	All year	Core	20	CORC193 Analytical Methods for Engineers 1
1	All year	Core	20	CORC194 Engineering Science 1
1	All year	Core	20	CORC1245 Engineering Applications in a Business Context
2	All year	Core	20	FENG137 Manufacture & Materials 1
2	All year	Core	20	CORC1244 Instrumentation, Control and Automation
2	All year	Option	20	CORC1230 Mechanical Engineering Technology
2	All year	Option	20	CORC1222 Electrical Engineering Technology
2	All year	Option	20	CORC1225 Marine Engineering Technology
2	All year	Option	20	CORC1231 Maintenance Engineering Technology
2	All year	Option	20	CORC1232 Aeronautical Engineering Technology

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 <u>Core</u> Modules
<p>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.</p> <p>By the end of this level of this programme the students will be able to demonstrate for a threshold pass:</p> <p>Learners must demonstrate an ability to solve engineering problems through the application</p>	<p>Primary: Lectures, tutorials, exercises, case studies, research.</p> <p>Secondary/Supplementary: Tutor feedback, peer learning, independent learning</p>	1 & 2	1 & 2	Formative class exercises using engineering science and mathematical principles.	(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 <u>Core</u> Modules
numerical, computational, analytical and technical skills using appropriate tools.				Coursework applying engineering theory. (CORC 193), (CORC 194) Examinations directed towards the solution of numerical problems. (CORC 193), (CORC 194)	
<p>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.</p>					
<p>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.</p> <p>By the end of this level of this programme the students will be able to demonstrate for a threshold pass:</p> <p>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.</p>	<p>Primary: Lectures, tutorials, exercises, case studies, research.</p> <p>Secondary/Supplementary: Tutor feedback, peer learning, independent learning</p>	1 & 2	1 & 2	<p>Formative class exercises using CAD software, materials testing and control hardware.</p> <p>Coursework investigating, costing and evaluating solutions. (CORC 1245)</p>	<p>(CORC 1245) (FENG 137) (CORC 1244)</p>

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 <u>Core</u> Modules
				Examination on manufacturing and materials. (FENG 137)	
<p>An explanation for embedding Cognitive and Intellectual Skills through Teaching & Learning and Assessment at this level of the programme:</p> <p>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 fulfilment through producing and documenting comprehensive solutions to authentic problems.</p>					
<p>Key Transferable Skills:</p> <p>Learners will develop a range of transferable skills covering analysis of information, problem solving, effective communication, formulate arguments, and apply themselves within a business context in a socially valuable way.</p> <p>By the end of this level of this programme the students will be able to demonstrate for a threshold pass:</p> <p>Learners will demonstrate the ability to exercise personal and professional responsibility, conducting high level analysis of designs that are business costed and sustainable.</p>	<p>Primary: Lectures, tutorials,</p> <p>Secondary/Supplementary: Peer feedback</p>	4	3	<p>Formative basic skills testing, research skills, class discussion.</p> <p>Coursework producing engineering designs and analysis. (CORC 1243)</p> <p>Coursework developing production plans and materials testing. (FENG 137)</p> <p>Coursework conducting personal skills audit and</p>	(CORC 1245) (FENG 137)

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 <u>Core</u> Modules
				reflection on team task. (CORC 1013) Examination on materials analysis and selection. (FENG 137)	
<p>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.</p>					
<p>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.</p> <p>By the end of this level of this programme the students will be able to demonstrate for a threshold pass:</p> <p>Learners will be the able to demonstrate that they can evaluate solutions and make decisions on the basis of cost, sustainability and social value.</p>	<p>Primary: Lectures, tutorials, work placements</p> <p>Secondary/Supplementary: Tutor, peer and employer feedback</p>	4 & 5	2, 3 & 4	Formative case study analysis. Coursework report on product design and development (CORC 1243) Coursework report on materials analysis and testing (FENG 137)	(CORC 1245) (FENG 137)

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 <u>Core</u> Modules
				Personal reflection on performance within group task work (CORC 1013)	
<p>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 are evaluated and assessed by the both tutor and learner, resulting in personal development plans.</p>					
<p>Practical Skills: Learners will be able to successfully and pragmatically apply the knowledge and skills they have acquired in the workplace.</p> <p>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.</p>	<p>Primary: Lectures, tutorials, workshops</p> <p>Secondary/Supplementary: Independent study, work placement</p>	3, 4 & 5	2 & 3	<p>Formative exercise in CAD drafting, material testing and manufacturing demonstration. (CORC 1243), (FENG 137)</p> <p>Coursework producing and costing. (CORC1243)</p> <p>Coursework testing and measuring material properties. (FENG 137)</p>	(CORC 1245) (FENG 137) (CORC 1244)
<p>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.</p>					

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:

All learners undertaking the Part Time HNC must be employed in an engineering role before commencing the course. If a learner ceases to be employed in an engineering position they can either transfer to the FdSc Engineering, or seek further employment or a WBL placement. Further WRL will take place during the curriculum, detailed as follows:

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 equipment manufacturing company.	3,4	2,3	Formative tasks to produce CAD drawing. Coursework producing and analysing an engineering component. Presentation on product costing and investment appraisal.	(CORC 1245)
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.	(FENG 137)

FHEQ level: 4					
WBL/WRL Activity:	Logistics	Prog Aim	Prog Intended LO	Range of Assessments	Related Core Module(s)
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	Examination with questions on material properties. Formative exercise programming control hardware. Coursework designing and specifying an industrial control system	(CORC 1244)
<p>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 that an appreciation develops around the practical usefulness 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.</p>					

PS15. Transitional Arrangements

N/A

PS16. Appendix - Module Details

Module Code	Module Title	Assessment mode	Short Module Descriptor
CORC193	Analytical Methods for Engineers 1	50% (Exam) 50% (CW)	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.
CORC194	Engineering Science 1	50% (Exam) 50% (CW)	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.
CORC1245	Engineering Applications in a Business Context	90% (CW) 10% (Practical)	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.
FENG137	Manufacture & Materials 1	50% (Exam) 50% (CW)	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.
CORC1244	Instrumentation, Control and Automation	50% (Exam) 50% (Practical)	This module develops an understanding of the development and integration of modern instrumentation, control and automation systems.
CORC1230	Mechanical Engineering Technology	100% (CW)	A module designed to develop the necessary knowledge and skills to apply mechanical engineering principles in industry in a professionally responsible way.
CORC1222	Electrical Engineering Technology	100% (CW)	A module designed to develop the necessary knowledge and skills to apply electrical engineering principles in industry in a professionally responsible way.
CORC1225	Marine Engineering Technology	100% (CW)	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.
CORC1231	Maintenance Engineering Technology	100% (CW)	A module designed to develop the necessary knowledge and skills to apply maintenance engineering principles in industry in a professionally responsible way.
CORC1232	Aeronautical Engineering Technology	100% (CW)	A module designed to develop the necessary knowledge and skills to apply aeronautical engineering principles in industry in a professionally responsible way.