

# Prifysgol Wrexham Wrexham University

## Programme Specification

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### Section 1 Regulatory Details

<b>Awarding body</b>	Wrexham University
<b>Teaching institution</b>	Wrexham University
<b>Final award and programme title (Welsh)</b>	BEng (Anrh) Ynni Carbon Isel, Effeithlonrwydd & Chynaliadwyedd (Prentisiaeth Gradd)
<b>Final award and programme title (English)</b>	BEng (Hons) Low Carbon Energy, Efficiency and Sustainability (Degree Apprenticeship)
<b>Exit awards and titles</b>	<ul style="list-style-type: none"> <li>• BEng (Ord) Low Carbon Energy, Efficiency and Sustainability</li> <li>• DipHE Low Carbon Energy, Efficiency and Sustainability</li> <li>• CertHE Engineering</li> </ul>
<b>Credit requirements</b>	<ul style="list-style-type: none"> <li>• BEng (Hons): 360 credits in total including a minimum of 120 credits at level 6</li> <li>• BEng (Ord): 300 credits in total including a minimum of 60 credits at Level 6</li> <li>• Dip HE: 240 credits in total including a minimum of 120 credits at level 5</li> <li>• Cert HE: A minimum of 120 credits at level 4</li> </ul>
<b>Does the programme offer Foundation Year route?</b>	No
<b>Placement / Work based learning</b>	<p>Within the programme, students are expected to be in a relevant full-time position and to apply relevant learning to their work-place through applied projects and utilising real-world examples within their assessments.</p> <p>Throughout the programme, applied projects and assignments are agreed in partnership with the employer and the apprentice to ensure that they enable improved productivity, innovation and business growth for each employer.</p>
<b>Length and level of the placement</b>	Work-based learning modules include ENG449, ENG5AM and ENG6AG
<b>Faculty / Department</b>	Faculty of Arts, Computing and Engineering
<b>HECoS Code</b>	100182, 100180, 100549
<b>Intake Points</b>	Three intakes per year, Sept, Jan and May
<b>Mode of Attendance</b>	Part time
<b>Normal Programme Length</b>	3 years
<b>Mode of Study and Location of delivery</b>	Campus based at Plas Coch Campus

<b>Language of delivery</b>	English
<b>Welsh Medium Provision</b>	The programmes will be delivered through the medium of English. Students are entitled to submit assessments in the medium of Welsh.
<b>Professional, Statutory or Regulatory Body (PSRB) accreditation</b>	<p>The programme is accredited by EI 2 years from September 2024 to August 2026 in partial fulfilment of knowledge and understanding requirement for CEng (Backdating from Sept 2022 to August 2024)</p> <p>The programme is accredited by IET 2 years from September 2024 to August 2026 in partial fulfilment of knowledge and understanding requirement for CEng (Backdating from Sept 2022 to August 2024) Monitoring visit in 2025/26</p>
<b>External reference points</b>	<p>Subject Benchmark Statement; Engineering February 2019</p> <p>Higher Education in Apprenticeships Characteristics Statement</p> <p>The Accreditation of Higher Education Programmes (AHEP)</p>
<b>Entry Requirements</b>	<p>The University website sets out the approved entry requirements for each programme, including minimum qualifications and English Language requirements.</p> <p>For the three-year degree apprenticeship route applicants must be in full time relevant employment in a role aligned to the Engineering Degree Apprenticeship (Wales) framework (2019). Decisions on entry for this programme will be made in partnership between the University and the Employer ensuring that the candidate meets the standard academic entry requirements as well as the professional and employer entry requirements which varies between employers. This will be determined pre-application by the programme leader and employer representative. All apprentices enter into a three-way learning agreement upon acceptance to the programme.</p> <p>48-72 UCAS tariff points from an appropriate Level 3 qualification such as A Levels 5 GCSEs at grade A*-C, including Maths and English Language/Welsh.</p> <p>Other learning and experience may be considered for entry to the programme. A student may be allowed entry if he or she does not have the standard entry qualifications but can provide evidence of necessary knowledge and skills to successfully enter and complete the course.</p>
<b>Record of Prior (Experiential) learning</b>	Applicants may enter the programme at various levels with Recognition of Prior Learning (RPL) or

	Recognition of Prior Experiential learning (RPEL) in accordance with the University Regulations.
<b>Is DBS check required on entry?</b>	No
<b>Does the Suitability for Practice Procedure apply to the programme?</b>	No
<b>Derogation to Academic Regulations</b>	<ul style="list-style-type: none"> <li>Whilst the pass mark is 40% overall, each element of assessment (where there is more than one assessment) requires a minimum pass mark of 30%.</li> <li>Failure may be compensated at level 4 and level 5, up to a maximum of 30 credits across the entire programme. Major individual and group-based project modules must not be compensated.</li> </ul>
<b>Date of Approval</b>	22 October 2021
<b>Date and type of Revision</b>	26 <sup>th</sup> March 2025 AM2 to replace ENG495 with ENG461, ENG496 with ENG4B2, ENG5AA with ENG537

## Section 2 Programme Details

### Aims of the programme

The key aims of the programme are to:

- Enable students to develop an in-depth knowledge relating to a career as a professional engineer in industry and management roles in industry.
- Develop a critical awareness of current issues and developments in engineering and industry.
- Develop skills related to engineering and demonstrate problem solving
- Enable students to analyse the social and environmental implications of engineering and industry
- Encourage critical skills, a knowledge of professional responsibility, integrity and ethics together with the ability to reflect on personal progress as a learner and undertake independent study at level 6 for the dissertation module.
- Demonstrate a critical awareness life-long learning and an appreciation of the value of education in continuing professional development.

Additionally, the student's competencies are to be assessed within the workplace by the employer; specifically, professional behaviour, health and safety and company roles, responsibilities and working practices. This will be evidenced within the three-way progress meetings throughout the programme by the personal/industry tutor.

The programme is designed to provide apprentices with the essential knowledge, skills and techniques which underpin and enhance the learning process. They will be encouraged to develop a positive, reflective and professional approach to their learning, taking responsibility for their own progression and career development.

These transferable skills enable and promote sustainable lifelong learning and continuing professional development within their professional field or sector. The programme is designed to provide an opportunity for apprentices to apply their knowledge, skills and ideas within their own working environment.

# Prifysgol Wreccsam Wrexham University

## Programme Structure Diagram, including delivery schedule

September Intake

Level	Module Code	Module Title	Credit Value	Core/Option	Delivery (i.e. S1,2)	Year of Study
4	ENG461	Engineering Mathematics	20	Core	S1	Y1
4	ENG4B7	Future Energy Systems & Sustainability	20	Core	S2	Y1
4	ENG4B2	CAD and Production Science	20	Core	S2	Y1
4	ENG449	Project (Environmental Audit Case Study)	40	Core	S1-3	Y1
4	ENG4AW	Engineering & Operations Management	20	Core	S3	Y1
5	ENG5AM	Project (Feasibility Study)	40	Core	S1-3	Y2
5	ENG537	Further Engineering Mathematics	20	Core	S1	Y2
5	ENG5AJ	Modern Manufacture, Sustainability & Industry 4.0	20	Core	S3	Y2
5	ENG5B2	Future Energy Systems & Sustainability	20	Core	S2	Y2
5	ENG5B3	Solar and Biomass Energy Engineering	20	Core	S2	Y2
6	ENG6AF	Product Design	20	Core	S1	Y3
6	ENG6AD	Maintenance & Safety Systems	20	Core	S1	Y3
6	ENG6B8	Energy saving, Low carbon and recycling systems	20	Core	S2	Y3
6	ENG6AE	Managing Workforce, Engagement & Commitment	20	Core	S2	Y3
6	ENG6AG	Project	40	Core	S1-3	Y3

January Intake:

Level	Module Code	Module Title	Credit Value	Core/Option	Delivery (i.e. S1,2)	Year of Study
4	ENG4B2	CAD and Production Science	20	Core	S2	Y1
4	ENG4B7	Future Energy Systems & Sustainability	20	Core	S2	Y1
4	ENG461	Engineering Mathematics	20	Core	S1	Y2
4	ENG4AW	Engineering & Operations Management	20	Core	S1	Y2
4	ENG449	Project (Environmental Audit Case Study)	40	Core	S1-3	Y1&2
5	ENG5B2	Future Energy Systems & Sustainability	20	Core	S2	Y2
5	ENG5B3	Solar and Biomass Energy Engineering	20	Core	S2	Y2
5	ENG5AM	Project (Feasibility Study)	40	Core	S3-1	Y2 &3
5	ENG5AJ	Modern Manufacture, Sustainability & Industry 4.0	20	Core	S3	Y2
5	ENG537	Further Engineering Mathematics	20	Core	S1	Y3
6	ENG6B8	Energy saving, Low carbon and recycling systems	20	Core	S2	Y3

6	ENG6AE	Managing Workforce, Engagement & Commitment	20	Core	S2	Y3
6	ENG6AG	Project	40	Core	S3-1	Y4
6	ENG6AF	Product Design	20	Core	S1	Y4
6	ENG6AD	Maintenance & Safety Systems	20	Core	S1	Y4

May Intake:

Level	Module Code	Module Title	Credit Value	Core/Option	Delivery (i.e. S1,2)	Year of Study
4	ENG449	Project (Environmental Audit Case Study)	40	Core	S1-3	Y1
4	ENG461	Engineering Mathematics	20	Core	S1	Y2
4	ENG4AW	Engineering & Operations Management	20	Core	S1	Y2
4	ENG4B2	CAD and Production Science	20	Core	S2	Y2
4	ENG4B7	Future Energy Systems & Sustainability	20	Core	S2	Y2
5	ENG5AJ	Modern Manufacture, Sustainability & Industry 4.0	20	Core	S3	Y2
5	ENG5AM	Project (Feasibility Study)	40	Core	S3-1	Y2 &3
5	ENG537	Further Engineering Mathematics	20	Core	S1	Y3
5	ENG5B2	Future Energy Systems & Sustainability	20	Core	S2	Y3
5	ENG5B3	Solar and Biomass Energy Engineering	20	Core	S2	Y3
6	ENG6B8	Energy saving, Low carbon and recycling systems	20	Core	S2	Y3
6	ENG6AE	Managing Workforce, Engagement & Commitment	20	Core	S2	Y3
6	ENG6AG	Project	40	Core	S3-1	Y4
6	ENG6AF	Product Design	20	Core	S1	Y4
6	ENG6AD	Maintenance & Safety Systems	20	Core	S1	Y4

## Programme Learning Outcomes

Undergraduate				
Knowledge and understanding				
	Level 4	Level 5	Level 6	Level 6 Honours Degree
A1	Develop an understanding of mathematical concepts or principles relevant to Engineering.	Apply mathematical concepts or principles relevant to Low carbon Engineering problems.	Apply mathematical principles and analytical techniques to integrated Industrial and Low Carbon Engineering problems.	Model and analyse complex industrial and low carbon systems using appropriate mathematical methods, while recognising the limitations of such analysis.
A2	Identify and explain scientific principles relevant to Engineering across a range of contexts.	Develop scientific principles and demonstrate an understanding of relevant applications within Industrial and Low Carbon Engineering.	Investigate Industrial and Low Carbon Engineering principles and applications.	Critically analyse complex industrial and low carbon engineering systems and demonstrate the ability to synthesise such engineering and systems.
A3	Develop an awareness of current technologies and their uses within Engineering across a range of contexts.	Analyse current and future technologies within Industrial and Low Carbon Engineering and develop an awareness of the sustainability implications.	Display a critical awareness of current issues and future prospects at the forefront of the discipline	Critically evaluate current and future developments within Industrial and Low Carbon Engineering and the careful consideration of the sustainability implications.

Intellectual skills				
	Level 4	Level 5	Level 6	Level 6 Honours Degree
B1	Identify problems and potential causes and effects.	Identify and analyse problems and use diagnostic methods to recognise causes and achieve satisfactory solutions.	Apply engineering principles to the solution of design and operation problems in industrial and low carbon engineering.	Innovate in solving novel and challenging problems and be aware of the limitations of the solutions in industrial and low carbon engineering.
B2	Identify, organise and use resources to complete tasks safely and efficiently	Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety and environmental impact.	Assess the resources and techniques used to complete tasks appropriately, and to achieve engineering objectives. Demonstrate a strong understanding of the	Critically assess the resources and techniques used to complete tasks, and to achieve engineering objectives. Recommend new techniques or use of resources based on a strong understanding of legal requirements, appropriate ethical conduct and associated risks that

Intellectual skills				
	Level 4	Level 5	Level 6	Level 6 Honours Degree
			legal requirements, appropriate ethical conduct and associated risks that may occur before, during and after the task has been completed.	may occur before, during and after the task has been completed.
B3	Apply given tools/methods to a well-defined problem and begin to appreciate the complexity of the issues.	Recognise and define key elements of problems and choose appropriate methods for their resolution in a considered manner.	Analyse, evaluate and interpret engineering data.	Critically appraise engineering problems. Generate and analyse data to solve complex engineering problems.
B4	Form opinions based upon knowledge and understanding of the subject in question.	Present arguments to uphold decisions following an evaluation of a particular subject.	Assess, interpret and implement decisions with an awareness of technical, economic and commercial implications.	Assess, interpret and implement decisions with a critical awareness of technical, economic and commercial implications.

Subject skills				
	Level 4	Level 5	Level 6	Level 6 Honours Degree
C1	Conduct given laboratory experiments to investigate engineering principles and properties of devices and systems.	Devise laboratory experiments to prove engineering principles and properties of devices and systems.	Conduct laboratory experiments to investigate engineering principles and properties of devices and systems in industrial and low carbon engineering.	Conduct and analyse experiments, adapting experimental procedures to novel situations if necessary, analysing experimental data in detail, and drawing comprehensive conclusions
C2	Design and construct devices and systems to meet given performance criteria.	Design and construct devices/systems and devise methods of testing to check for given performance criteria.	Design, construct, test and evaluate devices and systems to meet given performance criteria, including the use of computer-based tools where appropriate.	Design, construct, test and evaluate devices and systems to meet given performance criteria, including the use of computer-based tools.
C3	Monitor processes or systems across a range of	Monitor processes or systems, trend processes	Extract and evaluate information relating to	Analyse and evaluate processes, techniques or systems relating to unfamiliar problems with an awareness of

Subject skills				
	Level 4	Level 5	Level 6	Level 6 Honours Degree
	contexts, and develop an awareness of possible improvements.	and make predictions, in order to bring about continuous improvement.	industrial and low carbon engineering. Prepare descriptive, interpretive and evaluative technical reports.	quality issues and their application to continuous improvement.
C4	Propose and plan a self-directed individual programme of investigation.	Plan and undertake and report a self-directed individual programme of investigation and design.	Plan and carry out a personal programme of work.	Propose, plan, undertake and report a self-directed individual programme of investigation, design and implementation.

Practical, professional and employability skills				
	Level 4	Level 5	Level 6	Level 6 Honours Degree
D1	Identify basic information and suitable sources, carry out searches and bring information together in a way that ensures work is accurate, clear and properly saved.	Plan how to obtain and use required information for the purpose of an activity and use appropriate structures and procedures to explore and develop information.	Communicate effectively in writing, verbally and through graphical representations.	Identify problems, bias and recommendations effectively through graphical, written and verbal forms of communication.
D2	Use oral, written and electronic methods for the communication of technical and other information.	Use oral, written and electronic methods for effective communication of technical and other information.	Optimise use of resources and time in project planning and implementation.	Use information technology competently - to source information, to prepare reports, to model performance using specialised software packages.
D3	Apply safe systems of work.	Manage and apply safe systems of work.	Learn independently and be familiar with how to access key information.	Evaluate and reflect on own performance and self-management.
D4	Work reliably without close supervision accepting responsibility for tasks undertaken	Demonstrate the ability to work reliably and effectively without supervision accepting responsibility for tasks undertaken.	Demonstrate the practical skills of independent planning and execution of projects which relate to relevant engineering discipline.	Interpret the role of the engineer as a manager of himself/herself and of others, ensuring the highest level of professional and ethical conduct and acting within the legal framework governing engineering activities.

### Learning and teaching strategy

The programme is informed and guided by the Active Learning Framework (ALF), which incorporates a blended learning approach. This approach is a key part of the delivery and involves teaching, learning support, and the delivery of online sessions. The embedding of ALF provides students with a more flexible approach to their learning and is fundamental in giving all students equal opportunity to succeed. This is embedded in the University's Strategy for Supporting Student Learning and Achievement (SSSLA), which aims to 'drive the development of the pedagogic approaches required to enable flexible, accessible and inclusive curriculum delivery. It seeks to assist the student to become an independent learner, delivering subject skills alongside the embedding of skills for employment. The curriculum is designed to encourage an appreciation for learning. Learning is enriched by appropriate underpinnings, current research, industrial applications and the development of transferable skills.

The team recognises that the learning and teaching strategy should reflect the different requirements of both Degree Apprenticeships and the individual students. In order to achieve this the team have agreed the following strategy:

1. A key feature of apprenticeships is that the majority of learning and training takes place 'on-the-job' while apprentices are engaged in work activity. It is therefore fundamental that an apprentice's work will provide a source for learning, an environment for learning and the key context for learning. This is recognised by the team and supported by the programme leader linking the work-place to the programme of study.
2. To ensure that the teaching methods adopted for classroom and related activity are planned effectively so that tutors use a range of examples, reflecting the diversity of experiences when explaining the application of theory to practice. This will also provide the opportunity for apprentices to bring their work-based experiences back into the teaching space and develop a shared learning network with their peers.
3. To ensure that group discussions, case study / problem solving activity relate to and reflect the different aspects of practice represented within the classroom.
4. Where guest lecturers are used, they will be briefed by the module tutor to ensure that they are aware of the student profile and that the proposed presentation / lecture accommodates this.
5. Students will be supported by tutorial discussions between the tutor and student to ensure that the proposed learning reflects the practice needs of the student.
6. To ensure that the assessment strategy and methods of assessment are sufficiently flexible to enable students to apply and demonstrate their learning in a context which is relevant to them.
7. Academic skills will be embedded into all programmes and modules. This will be evident through the key skills mapping to learning outcomes in module specifications. These skills will be developed through learning and teaching activities, online support, formative and summative assessment. Students will be made aware of the importance of academic skills and the embedding of these will be reviewed periodically by the programme team.

The programme places emphasis on the importance of reflective learning, and envisages students drawing on informal and formal feedback to engage in a dialogue with staff to help plan their future learning. The three-way progress reviews required every 61 days provide a communication channel for apprentice, employer and provider to facilitate the shared learning between the workplace and the classroom or laboratory and for apprentice to receive feedback and manage progress through the apprenticeship, in line with expectations from HEFCW and QAA Higher Apprenticeships Characteristics Statement.

In addition, Apprentices, in negotiation with employers and programme leader, will be able to develop the ability to identify additional learning opportunities within the context of their day-

to-day work activity. For example, within the work-based learning module at level 4 apprentices will be able to undertake negotiated work-based projects that build on work activities and integrate knowledge, skills, behaviours and values developed through higher education learning. The learning and teaching methods adopted reflect the QCA /QAA descriptors in the following ways:

- Lectures are used to impart key information and show case new ways of working which will enable students to develop a sound understanding of the principles of their field of study as well as identifying new ways of working.
- Case studies, role plays, and group working will be used to facilitate application of the principles more widely. They will also be used to prompt discussion and practise problem solving skills. This will also allow students to evaluate the appropriateness of different approaches to solving problems.
- The use of portfolios facilitates reflection on the qualities necessary for employment, requiring the exercise of personal responsibility and decision making. Additionally, they will allow students to identify the limits of their knowledge and skills and identify strategies for development.
- Assessments are used to facilitate learning as well as providing an indication of student achievement.

The programme team has developed a strategic approach to delivering learning and teaching which meets the needs of the student group, enables skills development, allows for the practical application of knowledge and encourages students to become reflective and critically evaluative practitioners. The balance between face-to-face lectures and directed study is detailed within the module specifications. Students will be encouraged, through classroom activities and assessments, to reflect on both their own and organisational behaviour in order to improve their performance as well as giving them the knowledge and confidence to contribute towards the development of their organisational performance.

Learning and Teaching are activities which operate at different levels simultaneously. To the student the immediate activity relates to the explicit topics being studied. However, transferable skills are also inherent in order for the student to both carry out the tasks and to develop. These elements are built into the modules comprising the programme as what might be called embedded issues. Other embedded issues, such as awareness of environmental impact, sustainability and commercial implications are also integrated in modules throughout the programme.

### **Assessment strategy**

The programmes provide opportunities for formative, diagnostic and summative feedback. The assessment methods used reflect the needs of the student group and allows for the knowledge and learning outcomes of the programme to be tested as well as allowing for the development and assessment of practical and transferable skills.

Formative assessment will be utilised in all modules to allow students to develop, improve and prepare for summative assessment. The form of this assessment will vary depending on the module and skills being developed. Some form of feedback will be provided. These formative opportunities and how feedback will be delivered will be explained to students at the start of the module and on module spaces.

Where assessed group work is undertaken, students will be expected, through the production of meeting notes and action plans, to demonstrate that they have contributed equally to the task. This element of personal contribution will determine the individual's overall module assessment. i.e. not all students within a group should expect the same mark.

The achievement of the overall framework based on assessment of the qualification success and achievement of the relevant module learning outcomes in the credit and qualification aligned to the Degree Apprenticeship framework in Wales.

All assessment is underpinned by ALF and students will get the opportunity to demonstrate their academic skills in a variety of methods, with flexibility and accessibility being key factors. Assessment methods typically include formal exams, coursework, portfolios, continuous assessment and case studies. Where practicable, Turnitin will be used as a tool to support students to develop their academic writing style as well as to detect plagiarism or collaboration.

Formative assessment is essential to learning in its aim is to give appropriate and timely feedback to students on their learning, and to help them to improve their future work. Feedback, both formal and informal is given to students throughout the programme. Feedback may be verbal, given during tutorials or lab exercises, where both student and lecturer can identify problems and steps can be taken to improve future work. Feedback is presented as part of a continuous assessment plan, such as the development of Journals or Learning Logs; this may be verbal or written feedback, or it may be formal written feedback, as in the case of assignment marking with comments.

In addition, progress review updates are required between employer, apprentice and provider no less than every 61 days. This ensures a near constant feedback and communication cycle during the delivery of the apprenticeship. It should be noted that much of the feedback, not only identifies problems along with suitable guidance, but also highlights the student's achievements. This approach usually works better than simply "must try harder".

In some cases, 'progressive feedback' is the most suitable approach, particularly when there are many problems with an individual student's work. i.e. do not try to mend everything all at once, as this can lead to the student becoming demoralised, but rather work on the most important aspects first, whilst introducing other improvements later.

The unique nature of degree apprenticeship programmes afford an opportunity to get employers (especially the workplace mentor) involved with assessment. Employers will be invited to become involved with the scope and nature of any project work, which will directly affect project outcomes and their assessment.

### **Disclaimer**

Throughout quality assurance processes we have ensured that this programme engages with and is aligned to:

Academic Regulations: <https://wrexham.ac.uk/academic-regulations-policies-and-procedures/>

The University Skills Framework: <https://wrexham.ac.uk/careers/skills-framework/>

Welsh Language Policy: <https://wrexham.ac.uk/about/welsh-at-wrexham-university/>

Equality and Diversity Policy: <https://wrexham.ac.uk/about/equality-and-diversity/>

The Student Union offers support for students, please access their website <https://www.wrexhamglyndwrsu.org.uk/>