



Course Specification Part A

BEng (Hons) Electro-Mechanical Engineering HND Electro-Mechanical Engineering HNC Electro-Mechanical Engineering

CU Group* Academic Year: 2020/2021

****CU Group refers to Coventry University College Limited, a company wholly-owned by Coventry University. Its trading names are CU Coventry, CU Scarborough and CU London***

Please note: This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

We regularly review our course content, to make it relevant and current for the benefit of our students. For these reasons, course modules may be updated.

More detailed information on the learning outcomes, content, and teaching, learning and assessment methods of each module can be found in the Module Information Directory (MID), student module guide(s) and the course handbook.

The accuracy of the information contained in this document is reviewed by the University and may be verified by the Quality Assurance Agency for Higher Education.

PART A Course Specification (Published Document)

Electro-Mechanical Engineering

1. Introduction

The Engineering Institutions (and the Engineering Council which leads and acts as advocate) retain a fundamental list of learning outcomes for Engineering study at Bachelor's level:

- Scientific and mathematical principles (including integrated engineering)
- Engineering analysis (application of principles, modelling and systems analysis, quantitative methods and computer-based solutions)
- Design principles
- Economic, social and environmental context
- Engineering practice skills

Engineering is no longer solely about knowledge, as much of the knowledge gained in an undergraduate degree could be obsolete less than a decade later, but about the ability to self-develop and adapt in a constantly changing environment.

The above are addressed by BEng (Hons) Electro-Mechanical Engineering: an agile, flexible curriculum focused on interdisciplinary engineering knowledge and skills at a fundamental level, but aiming to develop creativity and problem-solving skills at higher levels.

The course focuses on fundamental engineering knowledge and skills in the first year, and on applying that knowledge and utilising those skills in the second year, working on realistic scenarios from the cutting edge of engineering in industry.

The innovative approach to final-year study, where the students undertake project-based learning linked to employers, in a simulated workplace environment, will ensure graduates not only have the intellectual capabilities and knowledge for their future career, but also the experience of modern engineering practice and working methods to maximise graduates' employment prospects. Project work will embrace all engineering sub-disciplines and will be set in an international context.

At the end of the course, graduates will not just have the knowledge and skills required for the contemporary engineering workforce, but will have genuine experience of applying them, working on engineering projects in a simulated workplace environment. They will be truly career-ready.

2 Available Award(s) and Modes of Study

Title of Award	Mode of attendance	UCAS Code	FHEQ Level
HNC Electro-Mechanical Engineering	F/T 1 year P/T 1.5 years		Level 4 (HNC)
HND Electro-Mechanical Engineering	F/T 2 years P/T 3 years		Level 5 (HND)
BEng (Hons) Electro-Mechanical Engineering	F/T 3 years F/T with year abroad (FY) 4 years F/T with sandwich (SW) year – 4 years P/T 4 years		Level 6 (BEng)

	Accelerated F/T 2 years		
3 Awarding Institution/Body	Coventry University.		
4 Collaboration			
5 Teaching Institution and Location of delivery	CU Group – CU Coventry, CU London, CU Scarborough		
6 Internal Approval/Review Dates	Date of approval: 18/07/18 Full review: 04/2027		
7 Course Accredited by			
8 Accreditation Date and Duration			
9 QAA Subject Benchmark Statement(s) and/or other external factors	<p>Engineering Council UK Standard for Professional Engineering Competence (UK-SPEC), 3rd Edition (Incorporated Engineer Standard abbreviated above as UK-SPEC) Engineering Council: The Accreditation of Higher Education Programmes, 3rd Edition (covers both IEng accreditation and partial CEng accreditation; abbreviated as AHEP above) QAA Subject Benchmark Statement for Engineering October 2019 (abbreviated as QAA above)</p> <p>Embedded Electronic Systems Design and Development Engineer Level 6 Degree Apprenticeship Standard https://www.gov.uk/government/publications/apprenticeship-standard-embedded-electronic-systems-design-and-development-engineer</p> <p>Electrical / Electronic Technical Support engineer level 6 Degree Apprenticeship Standard https://www.gov.uk/government/publications/apprenticeship-standard-electricalelectronic-technical-support-engineer</p>		
10 Date of Course Specification	February 2021		
11 Course Director	Paul Kanife, Head of Engineering and Digital Technologies, CU Coventry		

12 Outline and Educational Aims of the Course

The educational aims of the course are to provide:

1. A systematic understanding of key aspects of electrical, mechanical and embedded systems engineering, including acquisition of coherent and detailed knowledge at, or informed by, the forefront of the discipline
2. An ability to deploy accurately established techniques of engineering analysis and enquiry
3. The ability to self-manage learning and to devise and sustain arguments and solve problems, and to incorporate current research into sophisticated systems and control, or advanced scholarship within the discipline
4. An appreciation of the uncertainty, ambiguity and limits of engineering knowledge with regard to electrical and mechanical engineering, embedded systems and control technology
5. The ability to apply knowledge, methods and techniques to initiate and carry out electro-mechanical engineering projects
6. The ability to critically evaluate arguments, assumptions and data to make judgements and achieve a solution to a problem in a global context
7. The ability to communicate information, ideas, problems and solutions to specialist and non-specialist audiences
8. The transferable skills necessary for employment requiring the exercise of personal responsibility, complex decision-making and self-development of knowledge

13 Course Learning Outcomes

On successful completion of the course, a student will be able to:

1. Use knowledge and understanding of electrical, mechanical and embedded systems engineering to apply technical and practical skills to solve problems in developed technologies using analytical techniques
2. Contribute to the design, development and realisation of products, systems or processes to deliver engineering projects or services using established techniques and methods
3. Accept and exercise personal responsibility for project planning and management
4. Use effective communication and interpersonal skills in communicating technical matters
5. Demonstrate a commitment to professional engineering values, recognising obligations to society, professional ethics and the environment
6. Demonstrate the ability to work effectively and constructively as part of a multi-disciplinary team, to learn from reflecting on own performance and managing own personal development
7. Analyse and evaluate a range of technical data (primary and secondary) and engineering information to make effective, evidence-based decisions and solve problems based thereon; this includes the need for strong digital literacy and simulation analysis

14 Course Structure and Requirements, Levels, Modules, Credits and Awards

Modules within the course are all mandatory, of 30 credits; there are no prerequisites or co-requisites other than at stage 3, where the four modules will always be studied in the order given below.

HNC Electro-Mechanical Engineering	
400EN - Mathematical Principles for Engineers	Mathematical fundamentals at level 4, use of Matlab/MathCAD for calculation purposes
401EN Engineering Design Principles	CAD skills development (including ergonomics and anthropometrics, limits and fits, assembly and

	material selection), plus design and evaluation for a project
402EN Mechanical Engineering Principles	Statics, dynamics, stress/strain, materials science and behaviour, fluid mechanics
403EN Electrical and Electronic Principles	Electrical and electronic principles for DC and AC, components at low and high voltages, introduction to software, logic and control
HND Electro-Mechanical Engineering	
500EN Control of Mechatronic Systems	Mechatronic systems and microcontrollers
501EN Mechanical Engineering Systems	Solid mechanics, thermodynamics and heat transfer, CFD and FEA
502EN Renewable and Sustainable Engineering	Renewable energy, sustainability, sustainable engineering and ethics in design, materials selection and manufacture
503EN Smart Manufacturing Technology	Automation and data exchange, cyber-physical systems
BEng Electro-Mechanical Engineering	
600EN Embedded Systems Engineering	Electromechanical systems for measurement and metrology, monitoring and control of systems and operations. Software and communications design for electromechanical systems (e.g. wifi, apps, internet of things)
601EN Systems Operation and Control Project	Project cycle: conceive, design, implement, operate; implementation of concepts in previous module in a project relating to robotics and mechatronic control
602EN Project Management	Development of project proposal and plans for implementation, direct linkage to project (in a different engineering discipline)
603EN Engineering Project	Project cycle: conceive, design, implement, operate

The course has been mapped to the Embedded Electronic Systems Design and Development Engineer Level 6 Degree Apprenticeship Standard and the Electrical / Electronic Technical Support engineer level 6 Degree Apprenticeship Standard.

Full Time mode is designed for students who wish to study 120 credits (4 modules) in one academic year. Part Time is designed for anything less than this. The awards are offered in a range of delivery options and patterns which can be found on the relevant campus website.

During the final year of the BEng (Level 6) the teaching becomes student led, reflecting the intensity of material and the need to fully develop and further enhance critical thinking and analytical skills. The role of a professional graduate engineer is one of problem-solving and project participation and management, so the final year is wholly constructed around independent project work.

The course is taught in six-week blocks and can be offered (subjects to numbers) 6 times each calendar year.

Each one of the learning modules is worth 30 credits; these will require the equivalent of 300 study hours. The modules run over a six -week period and are taught consecutively, with assessments within each module. See website for details.

Students have the option of a sandwich year between levels 5 and 6, and can choose to study abroad or engage in a work placement. These can lead to a BA (Hons) degree with an international or professional enhancement respectively. Only the course mandatory modules will be counted towards the classification

calculation. The placement or year abroad optional modules do not count towards the award and are not calculated in the classification.

To progress to the placement year / study abroad year a student will normally have accumulated 240 credits, 120 at level 4 and at least 90 at level 5. Students who have failed one level 5 module may be eligible to progress to their placement/year abroad but must resit their outstanding Level 5 assessment in the next available block.

Students undertaking a relevant professional placement will be registered on the module 501CUC, Placement Year (0 credits) or on the module 502CUC, Study Abroad Year (0 credits) during their study year abroad.

The conditions for progression from one Level to the next and the classification of degrees awarded will be determined by the number and level of successful module passes achieved in accordance with the CU Group Regulations.

Cascade of Awards:

BEng (Hons) Electro-Mechanical Engineering (120 credits at level 4,5 and 6)



HND Electro-Mechanical Engineering (120 credits at both level 4 and 5)



HNC Electro-Mechanical Engineering (120 credits at level 4)

Module credit level	Module Code	Title	Credit Value	Mandatory/ Optional	Course Learning Outcomes	Pre-requisite
4	400EN	Mathematical Principles for Engineers	30	M	1, 7	None
4	401EN	Engineering Design Principles	30	M	2, 4	None
4	402EN	Mechanical Engineering Principles	30	M	1, 3, 7	None
4	403EN	Electrical and Electronic Principles	30	M	1, 2, 4, 6, 7	None
5	500EN	Control of Mechatronic Systems	30	M	1, 3, 7	None
5	501EN	Mechanical Engineering Systems	30	M	1, 3, 7	None
5	502EN	Renewable and Sustainable Engineering	30	M	2, 5, 7	None
5	503EN	Smart Manufacturing Technology	30	M	1, 2, 4, 7	None
6	600EN	Embedded Systems Engineering	30	M	1, 2, 3, 4, 5, 6	None
6	601EN	Systems Operation and Control Project	30	M	1, 2, 3, 5, 7	None
6	602EN	Project Management	30	M	2, 5, 6	None
6	603EN	Engineering Project	30	M	2, 5, 6	None

15 Criteria for Admission and Selection Procedure

UCAS entry profiles may be found by searching for the relevant course on the UCAS website, then clicking on 'Entry profile'.

The general requirements for admissions are in line with CU Group policy ([Academic Regulations: Regulations for the Admission of Students Section 4](#)), and are also available on the individual course websites.

Students whose first language is not English must demonstrate proficiency in the English language equivalent to IELTS 6.0.

Recognition of prior learning and accredited prior experiential learning (RP(E)L) may be taken into consideration and mapped onto the entry criteria for the course. RP(E)L is in accordance with CU Group Academic Regulations (see [Academic Regulations: Regulations for the Admission of Students Section 4](#)).

The minimum entry requirements to these programmes are that candidates should normally possess one of the following:

- A minimum of 64 UCAS tariff points, including two full A levels or equivalent for a HNC
- A minimum of 80 UCAS tariff points, including two full A levels or equivalent for a HND
- A minimum of 104 UCAS tariff points, including two full A levels or equivalent for a BA (Hons) Degree
- BTEC National Certificate or Diploma (equivalent points to those noted above) in a relevant subject
- Appropriate Foundation/Access qualification where the standard achieved is deemed equivalent to the above

Candidates will be expected to have passed maths and English language GCSE with minimum grade C, and hold a minimum of 5 GCSE's in total (level 2 alternatives such as functional skills are accepted).

16 Academic Regulations and Regulations of Assessment

This course conforms to the standard [CU Group Academic Regulations \(Mode F Section 6c\)](#)

17 Indicators of Quality Enhancement

The following are key indicators of quality and standards:

1. The course has been designed in accordance with the QAA Subject Benchmark Statement for Engineering (October 2019), UK-Spec (AHEP3) of Engineering Council and has been mapped to the Embedded Electronic Systems Design and Development Engineer Level 6 Degree Apprenticeship Standard and the Electrical / Electronic Technical Support engineer level 6 Degree Apprenticeship Standard. All staff who teach on the course are active in scholarship/research and have a range of professional experience in engineering, Master's qualifications in a relevant subject and years of teaching experience in higher education.
2. The record of graduates gaining employment in the engineering industry is excellent (100% either employed in relevant profession or in further education in 2016).
3. External Examiners report annually on the programme and their views are considered as part of the Course Quality, Enhancement Monitoring quality monitoring process (CQEM).
4. Student views are also sought through module and course evaluation questionnaires.
5. All programmes are subject to a major review involving subject experts external to the University Group and normally on a nine year cycle. At these reviews the views of current and former students, and partners from private, public and the third sectors are sought where appropriate.

In addition:

- Subject Matter Experts, who are highly experienced in curriculum design, were responsible for the development of the programme and modules
- Subject Matter Experts are typically actively engaged in the relevant industry sector as well as experienced members of academic faculty
- Course Leaders/Module Leaders will be responsible for the on-going production of teaching and learning materials and tools for assessment, in compliance with the specification and regulations.

The QAA's Higher Education Review undertaken in February 2015 confirmed that Coventry University, the Collaborative Partner meets the UK expectations regarding the:

- setting and maintenance of the academic standards of awards.
- quality of student learning opportunities.
- quality of the information about learning opportunities.
- enhancement of student learning opportunities.

18 Additional Information

Enrolled students have access to additional, key sources of information about the course and student support including,

Student Handbook

module VLE page

Module Information Directory

Study support information