Course Specification

MEng Electrical and Electronic Engineering
EECU050

BEng Electrical and Electronic Engineering
EECU049

Faculty of Engineering, Environment and Computing
School of Computing, Electronics and Mathematics
Academic Year: 2020-21

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.
1.0 Introduction

Electrical and electronic engineering is principally about the generation, control and application of electrical energy. Electrical and electronic engineers make enormous contributions in terms of technological invention and advancement in an extensive range of specialised fields such as in the automotive and aerospace industries were rapid advancements in technology are taking place example motor drive solutions via digital signal controllers. Similarly in civil engineering large projects such as the introduction of high speed trains require electrical and electronic engineers, equally there are innumerable other fields where electrical and electronic engineers make significant contributions. Graduates of this course are well prepared to take on challenges in the aforementioned fields of engineering and science typically progressing to lead/senior engineers, Chartered Engineer’s and if research inclined Doctors of Philosophy (PhD).

The distinctive innovative features of the programme are:

- Opportunity to study for an accredited (IET) BEng honours in Electrical and Electronic Engineering with the option to extend the study to complete a MEng degree in Electrical and Electronic Engineering.
- Optional course module choices at level 6 of the programme.
- Learning outcomes that are delivered by blended learning which incorporate activity led learning in core modules at each level of the course. This innovative blended learning strategy ensures that students experience a stimulating learning environment cultivated by a variety of means i.e. projects, problem solving, scenarios, and case-study, enquiry and research questions.
- This course as a common first year with the BEng in Electronic Engineering so a transfer could be possible at the end of first year of study.
- Personal tutor and academic tutoring to enhance your student experience.
- On campus support in areas such as mathematics and academic writing provided via The Sigma Maths and Stats Support, a drop-in centre 7 days a week in term time and the Centre for Academic Writing, both provide students with individualised advice and guidance.
- Advantage module scheme, levels 4, 5 & 6 of the course allow students to select a 10 special credit Add+vantage module at each level, the remit of this special scheme is to enhance career development. There are broad range of Add+vantage subject areas e.g. languages, business, computer networking and so on.
- Opportunities to broaden in a number of areas e.g. Creativity and Enterprise and Entrepreneurship; Work Experience, Global Experience via Field Trips and COIL Projects.
- Strong course factual focus and themes achieved by incorporating projects from companies within coursework and projects. Hence providing students with a motivating and rewarding learning experience that will help to prepare/synergise them for professional working life or higher level research opportunities.
- Contemporary and innovative teaching and learning environment offered within the Engineering Environment and Computing buildings with purpose built laboratories and studio facilities.
- Go abroad, Coventry University has excellent links with European Universities, this provides opportunities to broaden study and to gain international experience.
- Placement opportunities within UK industry via EEC Futures an award winning placement unit with links to business partners across a range of industries. EEC Futures manages placement opportunities which deliver unique openings for our students. Benefits: many students secured employment upon graduation at the company in which they undertook their and industrial placement, completion of a placement year strongly links to career prospects.
- Research themes, Coventry University’s strong commitment to applied research encourages students to become involved in research projects in many areas such as intelligent products and processes, power drive systems, sustainability, future transport systems, data Science and high-performance computing.
Sport at Coventry University excellent active health and fitness, for all levels and capabilities.

### 2 Available Award(s) and Modes of Study

<table>
<thead>
<tr>
<th>Title of Award</th>
<th>Mode of attendance</th>
<th>UCAS Code</th>
<th>FHEQ Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEng Honours Electrical and Electronic Engineering</td>
<td>FT4Y,*</td>
<td>H600</td>
<td>Level 7</td>
</tr>
<tr>
<td>BEng Honours Electrical and Electronic Engineering</td>
<td>FT3Y,*</td>
<td></td>
<td>Level 6</td>
</tr>
<tr>
<td>BEng Electrical and Electronic Engineering</td>
<td>Fall-back</td>
<td></td>
<td>Level 6</td>
</tr>
<tr>
<td>DipHE</td>
<td>Fall-back</td>
<td></td>
<td>Level 5</td>
</tr>
<tr>
<td>CertHE</td>
<td>Fall-back</td>
<td></td>
<td>Level 4</td>
</tr>
</tbody>
</table>

*allow one extra year if Professional Training (5012CEM) or Study Abroad Year (5013CEM) is undertaken.

### 3 Awarding Institution/Body

Coventry University

### 4 Collaboration

- 

### 5 Teaching Institution and Location of delivery

Coventry University, Coventry.

### 6 Internal Approval/Review Dates

Date of approval: September 2019
Date for next review: 2026/27

### 7 Course Accredited by

Accredited by the Institution of Engineering and Technology at CEng level (partial). IET regulations apply

### 8 Accreditation Date and Duration

From August 2019 intake to August 2021 (for two years)

### 9 QAA Subject Benchmark Statement(s) and/or other external factors

The QAA Subject Benchmark statements for Engineering are relevant to this course.

Subject Benchmark statements can be found at https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-engineering-15-masters.pdf?sfvrsn=fb91f681_16

The programme is designed to partially meet the requirements of the UK Standard for Professional Engineering Competence (UK-SPEC 2014), available at http://www.engc.org.uk/engcdocuments/internet/Website/UK-SPEC%20third%20edition%20%281%29.pdf,


Industrial Advisory Board, the IAB meets annually and drafts a report regarding course topics / alignment with industrial requirements

### 10 Date of Course Specification

2019

### 11 Course Director

Robert Jinks
12 Outline and Educational Aims of the Course

The main educational aim of the BEng Computer Hardware and Software Engineering course is to produce graduates with the knowledge, skills and understanding needed to make a significant contribution to the computer and electronics industry as a professional incorporated engineer. More specific aims of the course are:

**BEng:**
- To produce graduates with knowledge and understanding of scientific principles relevant to electrical and electronic engineering.
- To develop the cognitive skills required to work professionally on contemporary engineering projects.
- To develop the practical abilities expected of a professional electrical and electronic engineer.
- To provide the transferable skills and personal attributes expected by graduate employers of electrical and electronic engineers.
- To present a holistic view of engineering incorporating management, ethics, safety, economic, social and environmental factors.
- To provide an education consistent with Honours level of the QAA Framework, the UKSPEC Engineering Benchmark Statements (2015), and the recommendations of the Engineering Council and Institution of Engineering and Technology for Chartered Engineers.
- To motivate students with an engaging experience based on the concepts of Activity Led Learning.
- To further the University mission by providing an excellent education enriched by work-related learning and the experience of applied research.

**MEng:**
- To provide the versatility and depth of understanding to enable graduates to deal with new and uncertain/unusual challenges in electrical and electronic engineering, including the latest research.
- To foster imagination, creativity and the ability to innovate.
- To provide a sound understanding of the commercial context of engineering and of the commercial and technical risks associated with innovation.
- To equip graduates with a skill set that will enable them to progress rapidly to positions of responsibility providing technical, managerial and entrepreneurial leadership in specialist or inter-disciplinary projects.
13 Course Learning Outcomes

On successful completion of the programme a Master of Engineering / Bachelor of Electrical & Electronic Engineering graduate would have the following inherent abilities:

A) Apply scientific principles and methodologies relevant to electronic engineering and associated mathematical and quantitative methods in engineering analysis and design.

B) Understand concepts of engineering management including: ethics, finance, risk, health and safety, and similar issues and the wider multidisciplinary context of engineering; incorporating social, economic and environmental issues.

C) Appreciate scientific principles and mathematics related to their own and other disciplines including developing technologies and research and the concepts required to successfully deliver engineering projects including awareness of regulatory aspects of testing and manufacture of systems involving electrical and electronics i.e. electromagnetic coupling.

D) Analyse electronic systems and processes using appropriate modelling techniques to include problem solving involving uncertainty.

E) Design innovative products and systems employing recognised methodologies, plan and undertake projects.

F) Obtain data, create mathematical models, apply software and identify limitations in unfamiliar cases with critical evaluation of the results, propose and implement design solutions for new and emerging requirements.

G) Select and apply appropriate components, materials and manufacturing processes, execute practical work involving experimentation, data collection, prototype construction, testing and specialised instrumentation.

H) Employ specialised software tools and information technologies.

I) Access and evaluate varied information sources including: technical literature, standards, codes of practice, apply and critically evaluate engineering techniques in the context of commercial and industrial constraints.
<table>
<thead>
<tr>
<th>Credit level</th>
<th>Module Code</th>
<th>Title</th>
<th>Learning Credit</th>
<th>Assessment Credit</th>
<th>Mandatory/Optional</th>
<th>Course Learning Outcomes</th>
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<tr>
<td>4</td>
<td>4033CEM</td>
<td>Professional Skills</td>
<td>10</td>
<td>10</td>
<td>M</td>
<td>B,C,I</td>
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<tr>
<td>4</td>
<td>4040CEM</td>
<td>Analogue and Digital Electronics 1</td>
<td>20</td>
<td>20</td>
<td>M</td>
<td>A,D,E,H</td>
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<td>4038CEM</td>
<td>Engineering Mathematics 1</td>
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<td>20</td>
<td>M</td>
<td>C,F</td>
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<td>4</td>
<td>4036CEM</td>
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<td>M</td>
<td>A,D,E,H</td>
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<tr>
<td>4</td>
<td>4037CEM</td>
<td>Analogue circuits and embedded systems</td>
<td>20</td>
<td>20</td>
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<td>4023CEM</td>
<td>Introduction to Computer Engineering</td>
<td>20</td>
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<td>C,H</td>
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<td>4</td>
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<td>M</td>
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<td>5</td>
<td>5045CEM</td>
<td>Analogue and Digital Electronics 2</td>
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<td>5</td>
<td>5052CEM</td>
<td>Control and Instrumentation 1</td>
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<td>5</td>
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<tr>
<td>5</td>
<td>5037CEM</td>
<td>Manufacture of Electronic Systems for Regulatory Compliance</td>
<td>10</td>
<td>10</td>
<td>M</td>
<td>A,B,C,D,F,G,H,I</td>
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<tr>
<td>5</td>
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<td>10</td>
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<tr>
<td>5</td>
<td>5013CEM</td>
<td>Study Abroad Year</td>
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<tr>
<td>5</td>
<td>5012CEM</td>
<td>Professional Training</td>
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<td>6</td>
<td>6041CEM</td>
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<td>6</td>
<td>6032CEM</td>
<td>Power Systems</td>
<td>20</td>
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<td>6</td>
<td>6033CEM</td>
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<td>20</td>
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<td>O*</td>
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<tr>
<td>6</td>
<td>6009CEM</td>
<td>Power Semiconductor Devices and Convertors</td>
<td>20</td>
<td>20</td>
<td>O*</td>
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<tr>
<td>6</td>
<td>6039CEM</td>
<td>Individual Project Preparation</td>
<td>10</td>
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<tr>
<td>6</td>
<td>6040CEM</td>
<td>Individual Project Realisation</td>
<td>20</td>
<td>20</td>
<td>M</td>
<td>A,B,C,D,E,F,G,H,I</td>
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<tr>
<td>6</td>
<td>Add+Vantage</td>
<td></td>
<td>10</td>
<td>10</td>
<td>M</td>
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</tbody>
</table>
### 14.1 Add+Vantage Scheme

As required by University regulations, students will take one 10 credit Add+Vantage module at each of Levels 4 – 6 of their course. The Add+Vantage scheme is a University initiative for broadening students’ studies. There is a large collection of 10 credit modules in a wide variety of areas, many linked to ‘graduateness’ and ‘employability’. The scheme includes languages, law, advanced IT and mathematical skills.

### 14.2 Progression through the course:

To progress from one stage to the next, students must normally pass all modules. Students who fail to pass sufficient modules to progress will be considered under the Academic Regulations.

- To progress from Level 4 to Level 5 students must obtain at least 90 of the 120 available credits: pass all but the Add+Vantage module.
- To progress from Level 5 to professional training (5012CEM), students will be required to have gained 90 credits at Level 5: pass all but the Add+Vantage module.
- To progress from Level 5 to Level 6 students must obtain at least 90 of the 120 available credits: pass all but the Add+Vantage module.

To progress to the MEng programme students must complete their BEng (Hons) Electrical and Electronic Engineering study with an equivalent classification of 2:1 or higher and have completed the Engineering Impact module at level 6.

### 14.3 Professional Training or Study Abroad

Students may undertake a year out in industry or a year studying abroad between levels 5 and 6 of their course. Students will be enrolled onto relevant modules, which they must take and pass to achieve a Sandwich degree (5013CEM) or a Full Time with Study Abroad degree (5013CEM).

5012CEM or 5013CEM are non-credit bearing modules, pass/fail only. They cannot replace any course credits in the final award or be included in the overall award classification.

### 14.4 Conditions for the award of an MEng or BEng honours degree

The award of an MEng Electrical and Electronic Engineering honours degree requires:

A total of 480 Credits (derived from course modules as described in this course specification, module count can include accreditation for prior learning credits).
Only as single award will be awarded.
The award of an BEng Electrical and Electronic Engineering honours degree requires:
A total of 360 Credits (derived from course modules as described in this course specification, module count can include accreditation for prior learning credits).

14.5 Cascade of Awards

Each award meets requirements as per current course/academic regulations.

MEng Electrical and Electronic Engineering
↓
BEng Electrical and Electronic Engineering honours
↓
BEng Electrical and Electronic Engineering
↓
Diploma of Higher Education Electrical and Electronic Engineering
↓
Certificate of Higher Education Electrical and Electronic Engineering
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’.

For students entering with advanced standing, the AP(E)L, the procedure that is followed is that a mapping is undertaken to ensure that background qualifications are in alignment with module syllabi and are at a commensurate level (merit or greater).

16 Academic Regulations and Regulations of Assessment

This course conforms to current standard University Academic Regulations Undergraduate Mode E

17 Indicators of Quality Enhancement

The Course is managed by the CEM Board of Study of the Faculty of EEC

The Programme Assessment Board (PAB) for CEM is responsible for considering the progress of all students and making awards in accordance with both the University and course-specific regulations.

The assurance of the quality of modules is the responsibility of the Boards of Study which contribute modules to the course.

External Examiners have the opportunity to moderate all assessment tasks and a sample of assessed work for each module. They will report on the course and/or constituent modules and their views are considered as part of the Course Quality Enhancement Monitoring (CQEM). Details of the CQEM process can be found on the Registry’s web site.

Students are represented on the Student Forum, Board of Study and Faculty Board, all of which normally meet two or three times per year.

Student views are also sought through module and course evaluation questionnaires.

The CEM portfolio of industry-related research i.e. ongoing research into power semiconductor developments

An Industrial Advisory Board, provide input to course curriculum, management and development.

The report of QAA’s Institutional Audit undertaken in 2015 confirmed that:

- The maintenance of the threshold academic standards of awards offered on behalf of degree-awarding bodies and/or other awarding organisations meets UK expectations.
- The quality of student learning opportunities at the provider meets UK expectations
- The quality of the information produced by the provider about its provision meets UK expectations.
- The enhancement of student learning opportunities at the provider meets UK expectations.
Enrolled students have access to additional, key sources of information about the course and student support including:

- Faculty Student handbook
- Course Handbook
- Module Guides
- Module Information Directory
- Student Portal