Partnered with

The Knowledge Hub Universities
Egypt

Course Specification A

BEng (Hons) Electrical and Electronic Engineering

TKHU023

School of Engineering

Academic Year: 2023/2022

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 they take 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.

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. Changes have only been made where an aspect of the provision at Coventry University is not relevant to the delivery at TKH or where specific information relevant to the delivery of this course in Egypt must be introduced, e.g. entry requirements, course management.

PART A.1 Course Specification

BEng Electrical and Electronic Engineering

1. Introduction

This document outlines level 3 of the BEng Electrical and Electronic Engineering, and should be considered along with Part A.2 Electrical and Electronic Engineering document.

Electrical and Electronic Engineering Level 3
Level 3 course will normally introduce students where English is not their first language to the key concepts in Electrical and Electronic Engineering as well as the academic study skills and language they will need to operate effectively at degree level. Successful completion of the level 3 will enable progression to Level 4 of the BEng Electrical and Electronic Engineering programme. Level 3 consists of 80 credits of subject-specific modules and 40 credits of academic English skills modules. The course will be fully taught in English with embedded specialist English-language and study skills to support students in their further undergraduate study in Coventry University degree courses.

Overall Aims of level 3
Level 3 will enable students to:

- Become familiar with the key concepts in Electrical and Electronic Engineering.
- Develop the language and subject-specific academic study skills necessary to study at university level.
- Manage their own learning and acquire transferable skills such as communication, initiative and problem solving that equips and orientates students for higher education.

There is a global shortage of engineers, computing scientists and construction professionals and employment opportunities remain extremely buoyant.

The course is designed to foster a critical, analytical and experiential approach to embedded study skills and subject-specific academic English. The course supports students towards informed career choices, with awareness of their own strengths and knowledge of career pathways. Successful completion of this year will enable progression to year 2 (Level 4) of the BEng Electrical and Electronic Engineering programme.

This year aims to develop knowledge and skills that can be applied to solving scientific problems. The educational experience also aims to develop students' intellectual and personal skills. The course has equal proportions of applied science and engineering (40 credits), mathematics (40 credits) and English language (40 credits).

The mathematics modules cover algebra, descriptive and inferential statistics, trigonometry, vectors and vector operations, differential and integral calculus, some simple solution methods for various types of differential equations and methods to characterise and handle uncertainty. The Applied Science and Engineering modules aim to develop the student's working knowledge of the scientific theories that underpin the engineering disciplines. The first develops students' scientific knowledge and laboratory skills. The second module develops the theory and introduces the application of theory through the use of design, including the concept of prototyping and the use of computer aided design.

2 Outline and Educational Aims of the Course

Level 3 in BEng Electrical and Electronic Engineering is designed to provide an introduction to relevant mathematic concepts and scientific theories and their application in the design of engineering solutions.

Successful completion of the course enables progression to Level 4 of the BEng Electrical and Electronic Engineering programme

The course will be fully taught and assessed in English with embedded specialist English-language and study skills support.

The level 3 year of study forms part of the BEng in Electrical and Electronic Engineering programme.

Coventry University Level 3: General Course Aims:

Level 3 will enable students to:

- Become familiar with the key concepts in their chosen subject area.
- Develop the language and subject-specific academic study skills necessary to study at university level.
- Manage their own learning and acquire transferable skills such as communication, initiative and problem solving that equips and orientates students for higher education.

Electrical and Electronic Engineering **Level 3 - Specific Course Aims:**

Level 3 in Electrical and Electronic Engineering aims to provide students with a firm basis for onward study in this bachelor degree and develop knowledge and skills that can be applied to solving engineering problems. The educational experience also aims to develop students' intellectual and personal skills.

It provides opportunities for students to:

- Acquire a broad knowledge of mathematical concepts and physical science theories relevant to engineering and its' technological, environmental, cultural, economic and social context;
- Develop practical skills appropriate to computing;
- Strengthen study skills and academic English language skills, specific to the subject areas;
- Become an independent learner and acquire transferable skills such as communication, presentation, visual and digital fluency, critical reflection, initiative and problem solving;
- Recognise and respond appropriately to ethical values, the public interest and professional standards;
- Develop appropriate skills, understanding and experience to prepare students for successful transition into further and higher education in computing.

3 Course Learning Outcomes

A student who successfully completes the course will have achieved the following learning outcomes and be able to:

1. demonstrate an understanding of the relevant mathematical and scientific principles;
2. apply fundamental design and analysis methods to investigate and propose solutions to engineering problems;
3. apply knowledge of physical sciences to computing issues;
4. apply the necessary study and research skills in support of written, oral and group assessments;
5. contribute effectively to a team and implement the necessary planning to achieve objectives;
6. clearly communicate research, concepts, solutions and recommendations.

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

Modules within level 3 of the course and their credit value is identified in Table 1a. All modules are mandatory.

Table 1a: Module structure for Level 3

Module Credit Level	Module Code	Module Title	Credit Value	Course Learning Outcomes	Semester
3	KH3123CEM	Applicable Mathematics	20	1, 2	1
3	KH3125EXQ	Foundation Physics	20	1, 2, 3	1
3	KH3111HUM	Foundation Academic English 1 for Engineering and Computing	20	4, 5, 6	1
3	KH3129CEM	Applied and Computational Mathematics	20	1, 2	2
3	KH3126EXQ	Applied Science and Engineering	20	1, 2, 3	2
3	KH3112HUM	Foundation Academic English 2 for Engineering and Computing	20	4, 5, 6	2

Progression to level 4 BEng Electrical and Electronic Engineering

To progress to Level 4 of the BEng in Electrical and Electronic Engineering degree, a student must have passed or been credited with **all** the modules.

5 Criteria for Admission and Selection Procedure

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1 AS Level grade D and 5 GCSEs (including English Language, Mathematics and Science) at A*- C or 9 - 4 in the new GSCE grading structure OR 8 GCSEs (including English Language, Mathematics and Science) at A*- C or 9 - 4 in the new GSCE grading structure) OR Tawjihiya/General Secondary School certificate with minimum 60% OR Pass grades in IB Diploma.

In the case of applicants whose first language is not English, an adequate proficiency in English must be demonstrated. This would normally be a minimum IELTS score of 5.5 (with no less than 5.0 in each component) or equivalent.

All equivalent qualifications are welcome, as are mature students with alternative experience.

PART A.2 Course Specification

BEng Electrical and Electronic Engineering

1. Introduction

This document outlines level 4,5 and 6 of the BEng Electrical and Electronic Engineering and should be considered along with Part A.1 Electrical and Electronic Engineering document.

Electrical and electronic engineers make enormous contributions in terms of technological invention and advancement in an extensive range of fields i.e. the automotive and aerospace industries where rapid advancements in technology are taking place. Electric vehicle EV development will necessitate further advances to be able to accomplish future EV concepts such as more efficient battery and drive systems technology, power system network improvements to charge the rapidly increasing number of EV projected on the roads. Future changes in use and operation will see autonomous and shared EV's in operation and to accomplish this will require the networking of all EV's. To realise these aims requires skill sets of electrical and electronic engineers. Equally there are countless other fields such as renewable energy, next generation robotics, drones and industry automation, where electrical and electronic engineers will 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 Doctor of Philosophy (PhD).

The distinctive innovative features of the programmes are:

- Learning outcomes delivered by an agile strategy of campus and online learning with an array of support mechanisms to include a virtual learning environment and specialist software thus ensuring student study is stimulating.
- Opportunities to broaden in a number of areas e.g. Creativity and Enterprise and Entrepreneurship; Work Experience, Global Experience via COIL Projects.
- Strong course factual focus and modern 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 academic research opportunities.
- Contemporary and innovative teaching and learning environment offered within purpose-built laboratories and studio facilities.
- Coventry University has excellent links with European Universities, this provides opportunities to broaden study and to gain international experience.
- 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.

2. Available Award(s) and Modes of Study			
Title of Award	Mode of Attendance	UCAS Code	FHEQ Level
BEng Honours Electrical and Electronic Engineering Fallback Awards: BEng Electrical and Electronic Engineering DipHE Electrical and Electronic Engineering CertHE Electrical and Electronic Engineering	FT 3 years		Level 6

3. Awarding Institution / Body	Coventry University
4. Collaboration	Autonomous Franchise
5. Teaching Institution and location delivery	Coventry University Branch at TKH The Knowledge Hub Universities Campus New Administrative Capital, Residential Area 7, R7, Cairo Governorate
6. Internal Approval / Review Dates	Date of Approval: August 2019 Date for next review: 2025/2026

7. Course Accredited by	**N/A**
8.Accreditation Date and Duration	**N/A**
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 http://www.qaa.ac.uk The course is designed to partially meet the requirements of the UK Standard for Professional Engineering Competence (UK-SPEC), available at https://www.engc.org.uk/media/3877/uk-spec-v12-web.pdf and the Accreditation of Higher Education Programmes (AHEP), available at https://www.engc.org.uk/media/3464/ahep-fourth-edition.pdf
10 DBS requirement	Not required.
11 Date of Course Specification	May 2023
12 Course Director	TBC

13 Outline and Educational Aims of the Course

The main educational aim of the BEng Electrical and Electronic 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:

- 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 a general education consistent with Honours level of the QAA's Framework for Higher Education Qualifications and the incorporated engineer general and specific learning outcome statements of the Engineering Council's UK-SPEC 2020 and the Accreditation of Higher Education Programmes (AHEP 2020).
- 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.

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14 Course Learning Outcomes

A student who successfully completes the course will have achieved the following Course Learning Outcomes.

1. Science and mathematics
Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems in the field of electronics and communication.
2. Engineering analysis
Formulate and analyse complex electronics and communication problems based on literature and select appropriate computational/analytical techniques to reach substantiated conclusions.
3. Design and innovation
Design solutions for a complex electronics and communication problems by taking system approach and considering societal, user, business and customer needs.
4. The engineer and society
Evaluate the environmental and social impact of solutions to complex problems by identifying ethical issues, risks associated with a project and adopt a holistic and inclusive approach to engineering approach.
5. Engineering practice
Understanding of the role quality management systems, knowledge of characteristics of different products and equipment, and ability to apply relevant practical and laboratory skills.
6. Power and renewable energy
Integrated within the course are key subjects of energy generation, transmission & utilisation presented within a future context of smart grids, continuing integration of renewable energy and flow control.
7. Electrical Machine and Control engineering
Control engineering is presented via a blend of control theory and simulation in an engineering framework setting whereby a multitude of processes are analysed. Example this could be the design of an electrical machine and its subsequent speed torque control system.
8. Signal processing and Robotics
Signal processing technics are a key course focus in terms of analysing, modifying, and synthesizing signals, mathematical concepts such as Fourier analysis are applied to identify signal characteristics i.e. spectral components in order that they can be identified / further processed. Robotics are an illustrative example of an application of signal processing i.e. image recognition.
9. Additional general skills/Transferable skills
Apply different types of transferable skills such as communication skills, management skills, team working, and critical reflection on own and others work.

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15 Course Structure, Modules, Credits and Progression and Award Requirements

15.1 Progression through course

To progress from one level to the next, students must meet the requirements specified in the University regulations. 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 University Regulations.

15.2 Semester of Study/One Academic year at Coventry University (Optional)

The course structure and timing of delivery at The Knowledge Hub shall be aligned with the equivalent course at Coventry University to enable a student to complete a semester of study/one academic year at Coventry University as part of their studies. The marks achieved at Coventry University will be used in the assessment of the student's performance at the end of each level and used in the calculation of the final degree classification.

15.3 Conditions for fall back award

For a fall back award students must meet the relevant requirements specified in the University regulations.

Modules within the course, their status (whether mandatory or options), the levels at which they are studied, and their credit value are identified in the table below.

Credit level	Module Code	Title	Learning Credit	Assessment credit	Mandatory/ Optional	Course Learning Outcomes
4	KH4020CMD	Engineering Mathematics	20	20	M	1, 2
4	KH4001FTE	Electrical and Electronic Engineering Principles	20	20	M	1, 3, 6
4	KH4004ME	Engineering Design	20	20	M	3, 4, 5, 9
4	KH4011FTE	Analogue and Digital Devices	20	20	M	1, 2, 3, 6
4	KH4012FTE	Electronic Systems in Action	20	20	M	3, 4, 5, 6, 9
4	KH4013FTE	Introduction to Programming	20	20	M	3, 4
5	KH5026FTE	Signals and System Analysis	20	20	M	1, 2, 8
5	KH5024FTE	Manufacture of Electronic Systems	20	20	M	3, 4, 5
5	KH5021FTE	Analogue and Digital Systems	20	20	M	1, 2, 3, 5
5	KH5023FTE	Embedded System Design & Development	20	20	M	2, 3, 4, 5, 9
5	KH5027FTE	Electrical Engineering	20	20	M	1, 2, 3, 4, 5, 7
5	KH5028FTE	Analogue Control and Instrumentation	20	20	M	1, 2, 3, 7
6	KH6023FTE	Individual Project Preparation	20	20	M	2, 3, 4, 5, 9
6	KH6034FTE	Digital Signal Processing and Applications	20	20	M	1, 2, 3, 4, 8, 9
6	KH6035FTE	Power Electronics and Renewable Energy	20	20	M	1, 2, 3,4, 6
6	KH6027FTE	Individual Project Realisation	20	20	M	2, 3, 4, 5, 9
6	KH6037FTE	Digital Control and Instrumentation	20	20	M	1, 2, 3, 4, 5, 7,9
6	KH6039FTE	High Frequency Electronics	20	20	O	1, 2, 3, 4, 5
6	KH6040FTE	Power Systems	20	20	O	1, 2, 3, 4, 5, 6
Direct Entry Level 4 students for the purposes of Engineering Council Recognition ONLY must study the additional following modules:						
6	KH6035MAA	Business Simulation	20	20		
6	KH6082MAA	Project Management	20	20		

6	KH6039MAA	New Product Development Strategies	20	20		

15.4 Direct Entry Student seeking Engineering Council Recognition

Direct entry level 4 students wishing to gain Engineering Council recognition must study the additiona modules identified within the table above. These additional modules are not part of the Coventry University award.

Cascade of Awards:

BEng (Hons) in Electrical and Electronic Engineering
↓
BEng in Electrical and Electronic Engineering
↓
Diploma of Higher Education in Electrical and Electronic Engineering
↓
Certificate of Higher Education in Electrical Engineering

16. Criteria for Admission and Selection Procedure

Direct Entry to Levels 4 UCAS entry profiles may be found at
http://www.ucas.ac.uk/students/choosingcourses/entryrequirements

For details of acceptable equivalent qualifications for this course, please visit:
http://www.coventry.ac.uk/study-at-coventry/apply-now/entry-requirements-uk-eu-students/

A-level BBB to include Mathematics and one from Physics, Chemistry, Electronics, Engineering, Further Mathematics, Computer Science of Design Technology

OR

IB Diploma 29 points to include Mathematics and one from Physics, Chemistry, Design Technology or IT at a higher level.

In the case of applicants whose first language is not English, an adequate proficiency in English must be demonstrated. This would normally be a minimum IELTS score of 6.0 (with no less than 5.5 in each component) or equivalent

Non-standard entry students will be considered on a case-by-case basis.

17. Academic Regulations and Regulations of Assessment

This course conforms to the Regulations for the delivery of Coventry University Undergraduate awards at the Coventry University Branch at The Knowledge Hub, Egypt.

18. Indicators of Quality Enhancement

The Course is managed by the School of Computing Board of Study, of The Knowledge Hub.

The Programme Assessment Board (PAB) for The Knowledge Hub 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. This activity will be performed in partnership with Coventry University, UK.

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

Students are represented on the Student Forum and Board of Study, all of which normally meet two or three times per year. They are also represented at the branch board which happens once every year. Student views are also sought through module and course evaluation questionnaires.

The QAA's Higher Education Review undertaken in February 2015 confirmed that Coventry University 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

19. Additional Information

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

- Academic Course Director(s) are responsible for particular activities across the course and are able to provide advice and support to students in course-related matters;
- Student Handbook;
- Module Descriptors;
- CCQEM Reports;
- The Knowledge Hub Study Support Information.