Programme Specifications

Bachelor of Engineering (Honours) in Electrical Engineering

General Information

Awarding Institution: ECT (Engineering College of Technology)

Modes of Delivery: Online, Full-time & Part-time.

Course Title: Bachelor of Engineering (Honours) in Electrical Engineering (BEng Hons)

Interim Award Titles (Exit Awards):

- **Certificate of Higher Education (CertHE)**
- **Diploma of Higher Education (DipHE)**
- **Bachelor of Engineering (Ordinary) in Electrical Engineering (BEng)**

Programme Overview

The Bachelor of Engineering (Honours) in Electrical Engineering is a comprehensive programme designed to prepare graduates for the diverse and evolving field of electrical engineering. The programme blends core theoretical knowledge, practical skills, and professional competencies to produce engineers capable of designing, analysing, and managing complex electrical systems in real-world contexts.

Developed in consultation with industry professionals, the curriculum addresses both foundational principles and emerging technologies. In the early stages of the degree, students build a strong grounding in engineering mathematics, circuit theory, physics, and materials science, alongside an introduction to engineering ethics and professional practice. Modules in electronics design, programming, and rotating electrical machines provide the technical and problem-solving capabilities essential for modern engineering roles.

In the second year, the programme advances into specialised areas such as industrial control systems, communications and networks, transformers and switchgear, and the electricity supply chain. These are complemented by studies in engineering management and power electronics, ensuring graduates have the organisational and technical versatility demanded by employers.

The final year focuses on advanced and applied topics, including power system protection, renewable energy systems, and big data analytics in electricity grids. Students can tailor their learning through elective modules in areas such as industrial robotics, cybersecurity, power quality, or electrical safety. A major engineering capstone project allows students to integrate their knowledge, apply professional engineering methods, and address complex industry-relevant problems.

Throughout the programme, practical skills are developed using industry-standard software, simulation platforms, and remote laboratories, fostering hands-on competence even in an online environment.

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Professional skills in communication, teamwork, sustainability, and ethical decision-making are embedded across the curriculum, ensuring graduates are not only technically proficient but also workplace ready.

Graduates of the BEng (Hons) in Electrical Engineering will be well-prepared for diverse roles in power generation and distribution, renewable energy integration, automation, manufacturing, transport, telecommunications, and consulting. The qualification also provides a strong foundation for further postgraduate study, equipping engineers to lead innovation and adapt to a rapidly changing technological landscape.

Programme Aims

- Provide students with a comprehensive knowledge and understanding of electrical engineering principles, systems, and technologies, from core fundamentals to advanced applications.
- Develop practical and transferable skills in circuit design, system modelling, simulation, programming, and problem-solving.
- Prepare graduates for professional roles in sectors such as power generation and distribution, automation, manufacturing, telecommunications, and renewable energy.
- Foster awareness of professional responsibilities, including ethics, safety, sustainability, and inclusive engineering practice.
- Promote creative, critical, and systematic approaches to analysing and solving complex engineering problems.
- Enable students to undertake a substantial final-year project that demonstrates independent investigation, technical competence, and integration of knowledge.

Programme Learning Outcomes (PLOs)

Graduates of this programme will develop knowledge and skills aligned with internationally recognised engineering graduate attributes. The curriculum is designed to support pathways towards professional registration, including opportunities for further learning and career development.

1. Apply concepts, theories and techniques of the relevant natural and physical sciences and the engineering fundamentals applicable to electrical engineering.
2. Integrate conceptual understanding of mathematics, numerical analysis, and computer and information sciences with breath of knowledge, skills and in-depth understanding within the electrical engineering discipline.
3. Exhibit expertise and professional judgement in engineering design practice which acknowledges contextual factors impacting the engineering technology domain.
4. Adapt theoretical knowledge applicable to the discipline and propose innovative and sustainable engineering practices.
5. Apply advanced technical knowledge and appropriate tools alongside established engineering methods to solve complex engineering problems.
6. Apply engineering design and project management tools and methodologies to assess, mitigate, and manage risks, ensuring safety, security and ethical compliance in engineering practice underpinned by technical knowledge to systematically design and synthesise assigned project activities in a team environment.
7. Apply professional ethics and accountabilities in their engineering practice and will commit to ongoing professional development and lifelong learning.
8. Critically evaluate both sources and the validity of information; manage information effectively through clear verbal and written communication to accomplish a set of common goals and objectives in a multi-disciplinary engineering team.

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9. Draw from established engineering concepts, methods and industry standards to develop creative, innovation solutions to complex engineering problems by completing a capstone project in electrical engineering.
10. Demonstrate pro-active demeanour, self-management, professional conduct and leadership befitting Professional Incorporated Engineers, individually and in teams, via professional and industry exposure practice.

Programme Learning Outcome Mapping										
Programme Learning Outcomes	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
Year-1 Level 4										
BENG401	X	X			X					
BENG402	X	X			X			X		
BENG403	X	X	X		X		X	X		
BENG404		X	X	X		X	X	X		X
BENG405		X	X	X			X	X		X
BENG406	X	X	X		X			X		
BEEE411	X	X	X		X	X		X		
BEEE412	X	X	X		X	X	X	X		
Year-2 Level 5										
BENG501	X	X	X		X	X		X	X	
BENG502	X	X			X					
BENG503	X	X	X		X		X		X	X
BENG504	X	X	X		X	X		X	X	X
BEEE511	X	X	X		X	X		X		
BEEE512	X	X	X		X	X		X		
BEEE513	X	X			X			X		
BEEE514	X	X	X		X			X		
Year-3 Level 6										
BEEE611	X	X			X			X		
BEEE612	X	X			X	X		X		
BEEE613	X	X	X	X	X			X	X	
BENG601	X	X		X	X	X	X	X	X	X
BENG600	X	X	X	X	X	X	X	X	X	X
INDX005	X	X	X	X	X	X	X	X	X	X
PRAC001-004	X	X	X		X	X	X	X	X	X
Elective Modules (Students to select 2 from the list in Semester-1 Year-3) Level 6										
ELEC622	X	X	X	X	X	X	X	X		
ELEC623	X	X	X		X			X		
ELEC624	X	X	X		X		X	X		X
ELEC625	X	X	X		X			X		
ELEC626	X	X	X	X	X	X	X	X	X	

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Programme Structure

Students must complete a total of 360 credits comprising 22 modules and one capstone Project Thesis. The Project Thesis has 30 credits, and all other modules have 15 credits each.

There are optional elective modules for students to choose from.

The Bachelor of Engineering (Honors) in Electrical Engineering can be completed within the following registration periods:

Full time: minimum of three-years, maximum of six years.

Part time: minimum of six years, maximum of twelve years.

To qualify for graduation, students are required to complete or receive Recognition of Prior Learning (RPL) for one discipline-specific hands-on workshop unit PRAC001 - 004 and to undertake 240 hours of documented professional experience INDX001.

Assessment Regulations

- The pass mark for all modules and assessments is 40%.
- Students must achieve at least 40% in each module to be awarded the associated credits.
- Where applicable, compensation and reassessment opportunities will be provided in accordance with the institution's academic regulations.

Teaching periods:

Full-Time students undertake two teaching periods per year, completing four modules per semester plus one industrial experience module during the holiday break. This results in a total of eight modules completed annually. Scheduled breaks are provided between semesters and at the end of the academic year. To be eligible for graduation, students must complete or obtain recognition of prior learning (RPL) for four discipline-specific hands-on workshops.

Part-Time students also undertake two teaching periods per year, enrolling in two modules each semester and completing the capstone project in their final study period. This pathway allows students to progress at a reduced study load, with the degree expected to be completed within six years. Scheduled breaks are provided between semesters and at the end of the academic year. To be eligible for graduation, students must complete or obtain recognition of prior learning (RPL) for four discipline-specific hands-on workshops.

Rules of Completion

Successful completion of all modules, including required elective options, hands on workshops and industrial experience, is required before graduation.
All modules must be passed, or have exemptions, to achieve the qualification.

Other Protocols for the Programme

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Industry experience and practicals:

The nature of online learning means that most of our students are working in industry and can often demonstrate appropriate internships and partial or all compliance with practical workshops. Students who meet the Entrance Requirements and are working, or have worked, in a relevant role in industry may obtain RPL for the industrial experience modules and hands-on workshops.

For students unable to secure industry placements, ECT will facilitate practical learning through industry informed projects, placement and virtual placements depending on each individual situation. Our dedicated student support team will also actively engage with employers to identify and arrange suitable experiential learning/industry placement opportunities.

ECT delivers all core practical learning through virtual and remote laboratories, fully integrated into each module. These platforms provide real-world scenarios, simulations, and remote control of physical equipment, ensuring all students acquire the necessary hands-on skills, regardless of geographic location.

For students unable to gain RPL for the additional practical workshops: they can demonstrate practical competencies through one of the following pathways:

1. Local Industry-Based Practicals
Students may complete workshop or practical tasks at an engineering facility near them. These activities must be supervised and verified by a qualified engineering professional. Students will be provided with:

A logbook to record activities
Learning outcomes to be met
A verification form to be signed by the supervisor

Note that these are not 'tick and flick' type forms - ECT looks for hard evidence of practical tasks which are defined clearly and RPL isn't easily given.

2. In-Person Practical Workshops
Students may attend short, intensive practical workshops at our sites in South Africa, Australia, or the UK. These sessions are scheduled twice a year and must be booked in advance.

Students are responsible for travel and accommodation costs and are advised to plan accordingly based on their study progression. Some bursaries and scholarships may be available.

For support in selecting the best option or arranging placements, students may contact their Programme Leader or Learning Support Officer.

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PROGRAMME STRUCTURE (Full time) *		
Year/Semester	**Modules**	**Credit**
Y1/S1	BENG401 Engineering Mathematics 1	15
	BENG402 Electrical Circuit Theory and Analysis	15
	BENG403 Engineering Physics and Materials	15
	BENG404 Engineering Ethics and Professional Practice	15
Y1/S2	BENG405 Engineering Mathematics 2	15
	BENG406 Engineering Programming	15
	BEEE411 Fundamentals of Electronics & Electronics Design	15
	BEEE412 Rotating Electrical Machines	15
Y2/S1	BENG501 Engineering Mathematics 3	15
	BENG502 Engineering Management	15
	BENG503 Communications and Networks	15
	BENG504 Analysis and Modelling of Industrial Control Systems	15
Y2/S2	BEEE511 Electricity Supply Chain	15
	BEEE512 Transformers and Switchgear	15
	BEEE513 Power Electronics and Converters	15
	BEEE514 Signal Processing	15
Y3/S1	BEEE611 Power System Protection	15
	BEEE612 Renewable Energy Systems	15
	BEEE613 Big Data Analytics in Electricity Grids	15
	Elective-1 Select one module from:	
	ELEC624 Electrical Utilisation	
	ELEC625 Electrical Safety, Earthing and Lightning Protection	15
	ELEC626 Power Quality and Energy Efficiency	
	ELEC623 IT/OT Cyber Security	
	ELEC622 Industrial Robotics and Mechatronics	
Y3/S2	BENG601 Technology, Sustainability and Society	15
	BENG600 Engineering Capstone Project (Electrical Engineering)	30
	Elective-2 one module from: (must be different from Elective-1)	
	ELEC624 Electrical Utilisation	
	ELEC625 Electrical Safety, Earthing and Lightning Protection	15
	ELEC626 Power Quality and Energy Efficiency	
	ELEC623 IT/OT Cyber Security	
	ELEC622 Industrial Robotics and Mechatronics	

Additional Mandatory Modules	
Modules	**Credits**
PRAC001 Hands-on Workshop 1	0
PRAC002 Hands-on Workshop 2	0
PRAC003 Hands-on Workshop 3	0
PRAC004 Hands-on Workshop 4	0
INDX001 Industrial Experience	0

* The sequence of modules shown is indicative only. Actual module order will depend on the student's starting semester (Semester 1 or Semester 2).

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PROGRAMME STRUCTURE (Part time) *		
Year/Semester	**Modules**	**Credit**
Y1/S1	BENG401 Engineering Mathematics 1 BENG402 Electrical Circuit Theory and Analysis	15 15
Y1/S2	BENG403 Engineering Physics and Materials BENG404 Engineering Ethics and Professional Practice	15 15
Y2/S1	BENG405 Engineering Mathematics 2 BENG406 Engineering Programming	15 15
Y2/S2	BEEE411 Fundamentals of Electronics & Electronics Design BEEE412 Rotating Electrical Machines	15 15
Y3/S1	BENG501 Engineering Mathematics 3 BENG502 Engineering Management	15 15
Y3/S2	BENG503 Communications and Networks BENG504 Analysis and Modelling of Industrial Control Systems	15 15
Y4/S1	BEEE511 Electricity Supply Chain BEEE512 Transformers and Switchgear	15 15
Y4/S2	BEEE513 Power Electronics and Converters BEEE514 Signal Processing	15 15
Y5/S1	BEEE611 Power System Protection BEEE612 Renewable Energy Systems	15 15
Y5/S2	BEEE613 Big Data Analytics in Electricity Grids BENG601 Technology, Sustainability and Society	15 15
Y6/S1	**Elective-1 and Elective -2 Select <u>two</u> from:** ELEC624 Electrical Utilisation ELEC625 Electrical Safety, Earthing and Lightning Protection ELEC626 Power Quality and Energy Efficiency ELEC623 IT/OT Cyber Security ELEC622 Industrial Robotics and Mechatronics	30
Y6/S2	BENG600 Engineering Capstone Project (Electrical Engineering)	30

Additional Mandatory Modules	
Modules	**Credits**
PRAC001 Hands-on Workshop 1	0
PRAC002 Hands-on Workshop 2	0
PRAC003 Hands-on Workshop 3	0
PRAC004 Hands-on Workshop 4	0
INDX001 Industrial Experience	0

* The sequence of modules shown is indicative only. Actual module order will depend on the student's starting semester (Semester 1 or Semester 2).

Entry Requirements

The entrance requirements for direct entry students are as follows.

A level*: At least three A Levels, including Mathematics and a science subject (Physics, Chemistry, Computer Science/Computing, Design and Technology or Electronics).
Access to HE Diploma: Pass with 60 credits overall, including at least 45 credits at Level 3, with a minimum of 24 credits at Merit or above. These credits should include Mathematics and Physics which are required (112 UCAS points).
BTEC National Extended Diploma*: A qualification in Engineering or a related subject, (such as Aerospace / Aeronautical / Electrical / Electronic / Manufacturing and Mechanical Engineering,) will be considered. The program requires a minimum of Distinction, Merit, Merit (DMM), or Merit, Merit, Merit (MMM). You will also need to a suitable level 3 mathematics qualification.

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European Baccalaureate: EB Diploma result of 70%.
Foundation Year: Applications from students who have successfully completed an Engineering foundation year or a foundation course containing Mathematics and a Physical Science with an average of at least 55% will also be considered.
***GCSEs** – English Language and Mathematics at grade C or 4.
T Level – M: Including Maths and Physics. T Level in Engineering accepted.

International Baccalaureate: Overall Pass in the IB Diploma, including at least 14 points from three Higher Level Subjects.
BEng UCAS tariff points: 112

English language requirement for this course:

- Academic IELTS of 6.0 overall, with no element below 5.5.
- TOEFL iBT: 80 overall, with minimum scores of listening 17, writing 19, reading 18 and speaking 20. TOEFL Home Edition not accepted
- Pearson PTE: 60 overall, with no component below 59

Version Control				
Version	**Author**	**Date**	**Changes**	**Approved By**
1.0	ECT		Original Version	Validation Committee
1.1	HE Admin Specialist	28/01/2026	• Add version control table • Add clarity to the optional choices within the programme structure	Compliance & Risk Manager


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