

Course Specification

Course Summary Information		
1	Course Title	BEng (Hons) Electrical and Electronic Engineering BEng (Hons) Electrical and Electronic Engineering with Professional Placement Year BEng (Hons) Electrical and Electronic Engineering with Foundation Year
2	Course Code	US1543 / US1544 (PPY) / US1543F (FY)
3	Awarding Institution	Birmingham City University
4	Teaching Institution(s) (if different from point 3)	
5	Professional Statutory or Regulatory Body (PSRB) accreditation (if applicable)	

6	Course Description
	<p>Do you want to design and develop cutting-edge electrical and electronic systems that drive innovation and transform the way we live, work, and connect? Turn your passion into a future-proof engineering career with our reimagined and industry-focused BEng (Hons) Electrical and Electronic Engineering degree.</p> <p>Our approach to Engineering is unique. You will not have traditional lectures or be assessed by exams, instead you will learn through practical-based tasks that respond to real-life engineering problems across industries including telecommunications, renewable energy, electrical power, robotics and advanced manufacturing.</p> <p>This course has been carefully designed in collaboration with industry to ensure that you graduate ready for employment, with core technical skills and knowledge as well as employability skills such as communication, collaboration, problem-solving and leadership. You could have a career working with electric vehicles, robotics, smartphones and medical devices – the opportunities are endless!</p> <p>On this course you will:</p> <ul style="list-style-type: none"> • Learn through block delivery. This means you will study one module at a time across a 6-week period, allowing you to fully immerse yourself and get a deeper understanding of each subject. This style reflects how engineers work and shifts away from traditional models of teaching where you are expected to study multiple modules at one time. • Gain skills that industry need. You will tackle real-world challenges that are co-designed with industry partners, developing skills that the workforce needs. You will also receive feedback and mentorship from industry professionals on your work throughout the course. • Get experience in the workplace. Optional work experience modules are factored into the course, which you could also do abroad so that you leave with practical work experience to take forward into your career. In addition to this, you will have the opportunity to do a professional placement year after year two, to spend a year in industry before returning to complete your final year.

- Immerse yourself in practical learning. Each module includes hands-on, project-based tasks that enable you to conceive, design, implement and operate solutions based on the CDIO (Conceive Design Implement Operate) framework. This framework will transform you to think and act like an engineer and integrates professional skills into every aspect of work to ensure you graduate for industry.
- Be assessed through competency and not traditional exams or lectures. You will be assessed through your practical outputs that reflect real-world engineering and industry expectations to ensure that your learning transitions seamlessly into a future career
- Develop sustainability and digital knowledge. You will create solutions aligned with the United Nations Sustainable Development Goals (SDG) and use cutting-edge technology in modules looking at Smart Grids, Sustainable Energy, IoT, Cyber-Physical Systems, and Artificial Intelligence (AI) to stay ahead of engineering innovation.

What You'll Learn

This BEng (Hons) Electrical and Electronic Engineering course is designed to prepare you with the technical expertise, innovative mindset, and professional skills required to excel in today's engineering landscape. Here's what you'll learn:

- **Interdisciplinary Engineering and Collaboration:** Collaborate on innovative, multidisciplinary projects, integrating electrical, electronic, and mechanical principles. Develop skills in teamwork, problem-solving, and leadership.
- **Mechatronic Systems and Embedded Control:** Design and integrate mechatronic systems by combining sensors, actuators, and microcontrollers. Develop automation solutions and real-world control systems using programming, embedded technologies and PCB design.
- **Applied Analogue and Digital Electronic Circuits:** Design and implement analogue and digital circuits by integrating semiconductors, logic design, amplifiers, and filters to develop and test electronic systems for real-world applications.
- **Power Systems Automation, Power Electronics and Electrical Machinery:** Design and analyse electrical power systems with a focus on energy management and automation technologies. Explore the operation, control, and optimisation of electrical machinery such as transformers, motors, and generators, alongside their integration into industrial applications using advanced power electronics.
- **Intelligent Systems and Internet of Things (IoT) Applications:** Build and implement smart systems using IoT and Cyber-Physical Systems concepts. Apply AI and Machine Learning (ML) technologies for system monitoring, predictive maintenance, and data-driven decision-making.
- **Sustainable Energy and Smart Grid Integration:** Design renewable energy systems and smart grid solutions, focusing on solar, wind, and energy storage technologies to meet global sustainability needs.
- **Communication Technologies and Digital Signal Processing (DSP):** Investigate advanced communication systems and apply digital and analogue signal processing techniques to address real-world challenges in modern networks and data systems.

Foundation year: This is a preparatory year designed for students who are passionate about engineering but may not yet meet the entry requirements for our degree programmes. Over the course of a year, you'll build a solid grounding in key subjects such as mathematics, engineering principles, and problem-solving, while developing practical skills through hands-on projects and lab work. The foundation year will provide you with a smooth transition to progress on to one of our engineering degrees and set you up for a successful education journey.

7 Course Awards			
7a	Name of Final Award	Level	Credits Awarded
	Bachelor of Engineering with Honours Electrical and Electronic Engineering	6	360
	Bachelor of Engineering with Honours Electrical and Electronic Engineering with Professional Placement Year	6	480
7b	Exit Awards and Credits Awarded for the Electronic Engineering course		
	Certificate of Higher Education Electrical and Electronic Engineering	4	120
	Diploma of Higher Education Electrical and Electronic Engineering	5	240
	Bachelor of Engineering Electrical and Electronic Engineering	6	300

8 Variation from the University Regulations	
	This course has approved variations to the University's Academic Regulations. These can be accessed via the student contract page: https://www.bcu.ac.uk/student-info/student-contract

9 Delivery Patterns			
Mode(s) of Study	Location(s) of Study	Duration of Study	Code(s)
BEng (Hons) Full Time	City Centre	3 years	US1543
BEng (Hons) with Professional Placement Year	City Centre	4 years	US1544
BEng (Hons) with Foundation Year	City Centre	4 years	US1543F

10 Entry Requirements	
	The admission requirements for this course are stated on the course page of the BCU website at https://www.bcu.ac.uk/ or may be found by searching for the course entry profile located on the UCAS website.

11	Course Aims
	<p>Developed in partnership with industry, the BEng (Hons) Electrical and Electronic Engineering course is designed to prepare graduates to thrive in a rapidly evolving global industry. Emphasising project-based learning, interdisciplinary collaboration, sustainability, and emerging technologies, the course equips you with the technical expertise, innovative problem-solving skills, and professional competencies needed to excel and drive advancements in electrical and electronic engineering.</p> <p>The course aims to:</p> <ul style="list-style-type: none">• Provide you with practical expertise, technical skills, and knowledge in Electrical and Electronic Engineering, addressing critical regional and national demands for highly skilled and industry-ready engineers.• Prepare you to excel in modern engineering industries by mastering industrial digitalisation tools, automation technologies, and programming skills essential to driving innovation in the renewable energy, smart manufacturing, industrial automation, and intelligent systems sectors.• Equip you with the skills to collaborate effectively in interdisciplinary teams, utilising Science, Technology, Engineering, Arts, and Mathematics (STEAM) concepts and the CDIO framework to design and implement innovative solutions for industrial applications.• Instil an understanding of sustainability, safety and ethics in engineering practices, encouraging you to develop innovative and sustainable engineering solutions that align with the UN Sustainable Development Goals (SDGs).• Empower employability by cultivating transferable skills in project management, teamwork, leadership, and communication, ensuring graduates are equipped for leadership roles and meet industry expectations for professional behaviour and continuous professional development (CPD).• Ensure graduates gain the academic foundation required for professional recognition, meeting industry and IET accreditation standards to support progression towards Chartered or Incorporated Engineer status following relevant professional development in the industry.

12 Course Learning Outcomes	
Knowledge and understanding	
	Science, mathematics, and engineering principles
1	Apply knowledge of mathematics, statistics, natural science, and engineering principles to solve complex problems in electrical and electronic engineering, with applications in analogue and digital electronics, mechatronic systems, power systems, and communication technologies, contributing to sustainable industry innovation and infrastructure. (AHEP4, C1, SDG9)
	Engineering analysis
2	Systematically analyse complex electrical and electronic engineering problems, drawing on core concepts in analogue and digital electronics, intelligent systems and Internet of Things, sustainable energy and smart grids, to develop substantiated solutions. (AHEP4, C2, SDG7)
3	Select and apply computational and analytical techniques to model and solve complex electrical and electronic engineering problems, with applications in computer aided design, electrical machinery, power systems, and communication systems, advancing innovation and resilient infrastructure. (AHEP4, C3, SDG9)
4	Critically evaluate literature and technical resources to develop evidence-based solutions for complex electrical and electronic engineering problems in areas such as electronic circuit design, smart systems, electrical power and automation systems. (AHEP4, C4)
	Design and innovation
5	Design solutions for complex engineering problems to meet societal, user, business, and customer needs, considering health and safety, diversity, inclusions, cultural, societal, environmental matters, codes of practice, and industry standards, contributing to sustainable cities and communities. (AHEP4, C5, SDG11)
6	Apply an integrated and systems-based approach to address complex problems in electrical and electronic engineering, with emphasis on embedded systems, Internet of Things applications, digital signal processing, control and automation technologies. (AHEP4, C6)
Skills and other attributes	
	The engineer and society
7	Evaluate the environmental and societal impacts of electrical and electronic engineering solutions, focusing on minimizing adverse effects through sustainable and innovative practices. (AHEP4, C7, SDG12, 13,14,15)
8	Identify and address ethical concerns in electrical and electronic engineering practices, making informed decisions guided by professional codes of conduct and engineering standards. (AHEP4, C8, SDG16)
9	Apply risk management processes to identify, evaluate, and mitigate risks in electrical and electronic engineering projects, with a focus on ensuring safety, resilience, and sustainable energy solutions. (AHEP4, C9)
10	Adopt holistic and proportionate approaches to mitigating security risks in electrical and electronic systems, ensuring robust and reliable designs. (AHEP4, C10)
11	Adopt an inclusive approach to engineering practice, promoting equality, diversity, and inclusion in the design and implementation of electrical and electronic systems. (AHEP4, C11, SDG5,10)

Engineering Practice and Interdisciplinary STEAM Application	
12	Utilise practical laboratory and workshop skills to investigate and solve complex problems in electrical and electronic engineering systems. (AHEP4, C12)
13	Select and apply appropriate materials, equipment, and technologies in electrical and electronic engineering, recognising their limitations and ensuring efficient and sustainable practices. (AHEP4, C13)
14	Understand and apply quality management principles to ensure continuous improvement in electrical and electronic engineering systems and processes. (AHEP4, C14)
15	Apply engineering management principles, including project and change management, to electrical and electronic engineering projects, addressing legal considerations and intellectual property rights within a commercial context. (AHEP4, C15, SDG8)
16	Demonstrate effective teamwork and leadership skills in collaborative engineering projects, contributing to shared objectives and successful outcomes. (AHEP4, C16, SDG17)
17	Communicate complex engineering concepts effectively to diverse audiences, using appropriate technical and non-technical language. (AHEP4, C17)
18	Plan and document self-learning activities to support professional development and establish a foundation for lifelong learning. (AHEP4, C18, SDG4)
19	Demonstrate a comprehensive understanding of the principles of STEAM, recognizing their interdisciplinary roles in addressing complex real-world challenges, with an emphasis on sustainability, ethics, creativity, and technical innovation, contributing to quality education. (STEAM)
20	Apply STEAM knowledge collaboratively to design, evaluate, and present innovative solutions for complex problems, integrating technical, creative, and analytical skills while addressing interdisciplinary impacts and real-world challenges. (STEAM)

13	Employability
	<p>13a Development of Graduate Competencies</p> <p>The BEng (Hons) Electrical and Electronic Engineering course equips you with technical expertise and industry-aligned skills, preparing you for careers in smart technologies, automation, renewable energy, and smart grids. Through hands-on, project-based learning, you will develop the problem-solving, adaptability, and leadership skills needed to excel in global industries. This course ensures you graduate as a competent, future-ready engineer, prepared for professional roles, research, or further academic study.</p> <p>You will:</p> <ul style="list-style-type: none"> • Build proficiency in problem-solving, critical thinking, leadership, and communication through project-based learning and interdisciplinary collaboration. • Gain hands-on experience in engineering design, simulation, and prototyping, applying advanced computational and programming techniques to solve real-world challenges. • Engage in reflective practices, skill audits, and portfolio development, including CV writing, LinkedIn profiles, and tailored career planning. • Gain insight into personal strengths, values, and career aspirations through activities like Potential.ly and STAR technique training. <p>13b Employability Development</p> <p>Our employability strategy integrates the BCU Employability Framework, Graduate+, and Careers+ services to provide a robust support system for your success:</p> <ul style="list-style-type: none"> • Placement and Internship Support: Access industry-aligned placements, virtual internships, and work-based learning opportunities. • Career Development Workshops: Participate in CV and cover letter writing sessions, mock interviews, and assessment centre training using tools like CV360 and Graduates First Psychometric Tests. • Industry Engagement: Benefit from employer visits, guest talks and real-world projects designed in collaboration with industry partners. • Networking Opportunities: Build professional connections through LinkedIn profile creation, alumni mentorship programs, and career fairs. <p>13c Placement and Work Experience Opportunities</p> <p>While placements cannot be guaranteed, the course prioritises work-based learning opportunities through:</p> <ul style="list-style-type: none"> • A dedicated internal team to connect you with employers. • Industry collaborations for live briefs, sponsored projects, and virtual internships. • Structured guidance on speculative applications, leveraging the hidden job market, and preparing for placements in Year 2 or summer internships. <p>13d Future Careers / Progression</p> <p>Graduates will be equipped to excel in diverse roles requiring high-level skills in electrical and electronic engineering, including sectors such as:</p> <ul style="list-style-type: none"> • Power Systems Automation – Designing, controlling, operating, optimising and automating electrical power networks. • Renewable Energy and Smart Grids: Developing sustainable energy systems and intelligent grid solutions, integrating renewable sources, and enhancing grid stability and energy efficiency. • Internet of Things and Cyber-Physical Systems: Implementing connected devices and integrating cutting-edge digital technologies and embedded real-time systems. • Telecommunications and Signal Processing – Developing advanced communication networks, data transmission systems, and DSP techniques for modern wireless and communication technologies.

14	Course Learning, Teaching and Assessment Strategy
	<p>The Electrical and Electronic Engineering course embraces the Re-Imagine Engineering Initiative, placing project-based learning (PBL) and industry collaboration at its core, through a sequential block delivery structure. This forward-thinking approach eliminates traditional lectures and exams, replacing them with a structured scaffolding model that progressively builds your' skills through workshops, labs, CPD sessions, and industry-led projects.</p> <p>The course embraces the CDIO framework, integrating active, experiential learning with competency-based assessments aligned with industry demands. Learning is delivered by academics, industrial mentors, and project champions. You engage in hands-on projects, industry collaborations, and digital learning tools, equipping them with technical expertise, interdisciplinary skills, and professional competencies. This approach ensures graduates develop practical, job-ready expertise while tackling real-world engineering challenges.</p> <p><u>Learning and Teaching Strategy</u></p> <p>The course follows a block delivery structure, where You focus on one module at a time over six weeks, followed by one dedicated assessment week. Learning takes place in a homeroom environment for 2.5 days a week, where You work in cohorts of 40, fostering collaboration, teamwork, and peer learning. You also gain access to specialist labs, workshops, and industry-standard software tools, ensuring they develop technical expertise aligned with modern engineering industries.</p> <p>Scaffolded learning in mathematics is embedded across the curriculum, ensuring you progressively build analytical, computational, and problem-solving skills essential for circuit analysis, control systems, automation, and data-driven decision-making. Similarly, project management skills are developed using a structured approach, where you learn to plan, execute, and evaluate engineering projects with increasing complexity, applying industry-recognized methodologies to manage real-world challenges effectively.</p> <p>The course integrates STEAM principles, combining engineering, design thinking, and creative problem-solving, encouraging innovation and interdisciplinary collaboration. You also benefit from comprehensive employability resources, including careers workshops, LinkedIn optimisation, CV-building sessions, and networking opportunities with industry professionals. Work placements, virtual internships, and industry mentoring further enhance professional readiness.</p> <p>This competency-based, industry-integrated approach, reinforced by scaffolded learning in mathematics and project management, ensures graduates are technically proficient, professionally prepared, and equipped to lead and innovate in rapidly evolving engineering industries.</p> <p><u>Assessment Strategy</u></p> <p>The assessment strategy upholds academic standards in line with the Framework for Higher Education Qualifications (FHEQ) while adopting a competency-based approach that evaluates both individual and group performance. This ensures you develop and demonstrate technical expertise, problem-solving abilities, and professional competencies through real-world applications.</p> <p>Assessment is 100% coursework-based (Portfolio), focusing on individual competency development and collaborative project work. Projects serve as the primary assessment mode, requiring you to conceive, design, implement, and evaluate engineering solutions. Assessments are conducted throughout the block, with mid-block reviews providing formative feedback and a final submission in the 7th week of every block, ensuring continuous skill progression.</p> <p>You receive regular project reviews, design critiques, and team presentations, offering continuous feedback to refine both technical and collaborative skills. Ongoing competency assessments</p>

evaluate technical progress, problem-solving abilities, and professional behaviours in both individual and group settings. Assessment methods may include technical reports, presentations, prototype demonstrations, lab-based assessments, and reflective evaluations to support critical thinking and continuous learning.

Validity and consistency are ensured through transparent assessment briefs and criteria, maintaining clarity, fairness, and alignment with learning outcomes. The Course Monitoring and Enhancement process, supported by External Examiners and industry advisors, ensures assessments remain rigorous, industry-relevant, and continuously improved.

15 Course Requirements

15a Level 3:
Level 3 modules apply to the foundation year students only. You must complete the following core modules (totalling 120 credits) if you enrol in this course with foundation year:

Module Code	Module Name	Credit Value
RE3.1	Future Manufacturing and Design	30
RE3.2	Mechanical Engineering Application Toolkits	30
RE3.3	Automotive Engineering Practice	30
RE3.4	Electrical and Electronic Engineering Practice	30

Level 4:
In order to complete this course a student must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value
RE4.1	Mechatronic Systems Engineering	30
RE4.2	Computer Aided Design	30
RE4.5	Electronic Circuits Design	30
RE4.6	Electrical Machinery and Drives	30

Level 5:
In order to complete this course a student must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value
RE5.11	Intelligent Systems Engineering	30
RE5.3	Embedded Control Systems Design	30
RE5.7	Electrical Power Systems Engineering	30
RE5.10	Leadership for Engineering Excellence	30

Professional Placement Year (optional)

To qualify for the award of BEng (Hons) Electrical and Electronic Engineering with Professional Placement Year, you must successfully complete all of the modules listed as well as the following Level 5 module:

Module Code	Module Name	Credit Value
RE5.12	Professional Placement Year	120

Level 6:

In order to complete this course a student must successfully complete all the following CORE modules (totalling 90 credits):

Module Code	Module Name	Credit Value
RE6.6	Communication Systems Design	30
RE6.7	Sustainable Energy and Smart Grid	30
RE6.3	Final Year Honours Project	30

In order to complete this course a student must successfully complete at least 30 credits from the following indicative list of OPTIONAL modules.

Module Code	Module Name	Credit Value
RE6.4	Extended Final Year Honours Project	30
RE6.5	Engineering Micro/Virtual Placement	30

15b Structure Diagram

Please note list of optional modules is indicative only. Students' choice will not be guaranteed for optional modules, but a fair and transparent process will be adopted and shared with students.

Include a structure diagram for each mode of study. Level 4 is completed as an example including modules which extend the whole year.

Level 3

SEMESTER ONE		SEMESTER TWO	
Core (EEE Pathway)			
RE3.1: Future Manufacturing and Design (30)	RE3.2: Mechanical Engineering Application Toolkits (30)	RE3.3: Automotive Engineering Practice (30)	RE3.4: Electrical and Electronic Engineering Practice (30)

Level 4

SEMESTER ONE		SEMESTER TWO	
Core (EEE Pathway)			
RE4.1: Mechatronic Systems Engineering (30)	RE4.2: Computer Aided Design (30)	RE4.5: Electronic Circuits Design (30)	RE4.6: Electrical Machinery and Drives (30)

Level 5

SEMESTER ONE		SEMESTER TWO	
Core (EEE Pathway)			
RE5.11: Intelligent Systems Engineering (30)	RE5.3: Embedded Control Systems Design (30)	RE5.7: Electrical Power Systems Engineering (30)	RE5.10: Leadership for Engineering Excellence (30)

Optional

A Year Long
Optional to All Pathways
RE5.12: Professional Placement Year (120)

Level 6

SEMESTER ONE		SEMESTER TWO	
Core EEE Pathway		Optional (All Pathways)	
RE6.6: Communication Systems Design (30)	RE6.7: Sustainable Energy and Smart Grid (30)	RE6.3: Final Year Honours Project (30)	RE6.4: Extended Final Year Honours Project (30) OR RE6.5: Engineering Micro/Virtual Placement (30)

16 Overall Student Workload and Balance of Assessment

Overall student *workload* consists of class contact hours, independent learning and assessment activity, with each credit taken equating to a total study time of around 10 hours. While actual contact hours may depend on the optional modules selected, the following information gives an indication of how much time students will need to allocate to different activities at each level of the course.

- *Scheduled Learning* includes lectures, practical classes and workshops, contact time specified in timetable
- *Directed Learning* includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning
- *Private Study* includes preparation for exams

The *balance of assessment* by mode of assessment (e.g. coursework, exam and in-person) depends to some extent on the optional modules chosen by students. The approximate percentage of the course assessed by coursework, exam and in-person is shown below.

Level 3

Workload

34% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	408
Directed Learning	192
Private Study	600
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Portfolio	100%

Level 4

Workload

34% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	408
Directed Learning	192
Private Study	600
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Portfolio	100%

Level 5
Workload
34% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	408
Directed Learning	192
Private Study	600
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Portfolio	100%

Professional Placement Year (Optional):
Workload

Activity	Number of Hours
Scheduled Learning	0
Directed Learning & Private Study	1480 hours (including all leaves and holidays)
Total Hours	1200 (minimum)

Balance of Assessment

Assessment Mode	Percentage
Portfolio	100%

Level 6
Workload
20% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	240
Directed Learning	540
Private Study	420
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Portfolio	100%

Appendix 1

Curriculum Mapping

Course Learning Outcomes Vs Specific Modules

Key:

D = Developing learning outcomes and partially assessed

A = Assessed that learning outcomes are being met

Course Learning Outcomes (CLOs) mapping against Level 3 Modules		RE3.1: Future Manufacturing and Design	RE3.2: Mechanical Engineering Application Toolkits	RE3.3: Automotive Engineering Practice	RE3.4: Electrical and Electronic Engineering Practice
CLO No.					
1	Apply knowledge of mathematics, statistics, natural science, and engineering principles to solve complex problems in electrical and electronic engineering, with applications in analogue and digital electronics, mechatronic systems, power systems, and communication technologies, contributing to sustainable industry innovation and infrastructure. (AHEP4, C1, SDG9)	D	D	D	D
2	Systematically analyse complex electrical and electronic engineering problems, drawing on core concepts in analogue and digital electronics, intelligent systems and Internet of Things, sustainable energy and smart grids, to develop substantiated solutions. (AHEP4, C2, SDG7)	D			
3	Select and apply computational and analytical techniques to model and solve complex electrical and electronic engineering problems, with applications in computer aided design, electrical machinery, power systems, and communication systems, advancing innovation and resilient infrastructure. (AHEP4, C3, SDG9)	D			
4	Critically evaluate literature and technical resources to develop evidence-based solutions for complex electrical and electronic engineering problems in areas such as electronic circuit design, smart systems, electrical power and automation systems. (AHEP4, C4)			D	
5	Design solutions for complex engineering problems to meet societal, user, business, and customer needs, considering health and safety, diversity, inclusions, cultural, societal, environmental matters, codes of practice, and industry standards, contributing to sustainable cities and communities. (AHEP4, C5, SDG11)	D			D
6	Apply an integrated and systems-based approach to address complex problems in electrical and electronic engineering, with emphasis on embedded systems, Internet of Things applications, digital signal processing, control and automation technologies. (AHEP4, C6)		D		
7	Evaluate the environmental and societal impacts of electrical and electronic engineering solutions, focusing on minimizing adverse effects through sustainable and innovative practices. (AHEP4, C7, SDG12-15)			D	D
8	Identify and address ethical concerns in electrical and electronic engineering practices, making informed decisions guided by professional codes of conduct and engineering standards. (AHEP4, C8, SDG16)	D			
9	Apply risk management processes to identify, evaluate, and mitigate risks in electrical and electronic engineering projects, with a focus on ensuring safety, resilience, and sustainable energy solutions. (AHEP4, C9)		D		
10	Adopt holistic and proportionate approaches to mitigating security risks in electrical and electronic systems, ensuring robust and reliable designs. (AHEP4, C10)				

Course Learning Outcomes (CLOs) mapping against Level 3 Modules		RE3.1: Future Manufacturing and Design	RE3.2: Mechanical Engineering Application Toolkits	RE3.3: Automotive Engineering Practice	RE3.4: Electrical and Electronic Engineering Practice
CLO No.					
11	Adopt an inclusive approach to engineering practice, promoting equality, diversity, and inclusion in the design and implementation of electrical and electronic systems. (AHEP4, C11, SDG5,10)	D			
12	Utilise practical laboratory and workshop skills to investigate and solve complex problems in electrical and electronic engineering systems. (AHEP4, C12)	D	D	D	D
13	Select and apply appropriate materials, equipment, and technologies in electrical and electronic engineering, recognizing their limitations and ensuring efficient and sustainable practices. (AHEP4, C13)			D	D
14	Understand and apply quality management principles to ensure continuous improvement in electrical and electronic engineering systems and processes. (AHEP4, C14)				
15	Apply engineering management principles, including project and change management, to electrical and electronic engineering projects, addressing legal considerations and intellectual property rights within a commercial context. (AHEP4, C15, SDG8)				
16	Demonstrate effective teamwork and leadership skills in collaborative engineering projects, contributing to shared objectives and successful outcomes. (AHEP4, C16, SDG17)	D			D
17	Communicate complex engineering concepts effectively to diverse audiences, using appropriate technical and non-technical language. (AHEP4, C17)		D		
18	Plan and document self-learning activities to support professional development and establish a foundation for lifelong learning. (AHEP4, C18, SDG4)				
19	Demonstrate a comprehensive understanding of the principles of STEAM, recognizing their interdisciplinary roles in addressing complex real-world challenges, with an emphasis on sustainability, ethics, creativity, and technical innovation, contributing to quality education. (STEAM)	D		D	
20	Apply STEAM knowledge collaboratively to design, evaluate, and present innovative solutions for complex problems, integrating technical, creative, and analytical skills while addressing interdisciplinary impacts and real-world challenges. (STEAM)		D		D

CLO No.	Course Learning Outcomes (CLOs) mapping against Level 4 Modules	RE4.1: Mechatronic Systems Engineering	RE4.2: Computer Aided Design	RE4.5: Electronic Circuit Design	RE4.6: Electrical Machinery and Drives
1	Apply knowledge of mathematics, statistics, natural science, and engineering principles to solve complex problems in electrical and electronic engineering, with applications in analogue and digital electronics, mechatronic systems, power systems, and communication technologies, contributing to sustainable industry innovation and infrastructure. (AHEP4, C1, SDG9)	D	D	D	
2	Systematically analyse complex electrical and electronic engineering problems, drawing on core concepts in analogue and digital electronics, intelligent systems and Internet of Things, sustainable energy and smart grids, to develop substantiated solutions. (AHEP4, C2, SDG7)			D	
3	Select and apply computational and analytical techniques to model and solve complex electrical and electronic engineering problems, with applications in computer aided design, electrical machinery, power systems, and communication systems, advancing innovation and resilient infrastructure. (AHEP4, C3, SDG9)		D		D
4	Critically evaluate literature and technical resources to develop evidence-based solutions for complex electrical and electronic engineering problems in areas such as electronic circuit design, smart systems, electrical power and automation systems. (AHEP4, C4)			D	
5	Design solutions for complex engineering problems to meet societal, user, business, and customer needs, considering health and safety, diversity, inclusions, cultural, societal, environmental matters, codes of practice, and industry standards, contributing to sustainable cities and communities. (AHEP4, C5, SDG11)				D
6	Apply an integrated and systems-based approach to address complex problems in electrical and electronic engineering, with emphasis on embedded systems, Internet of Things applications, digital signal processing, control and automation technologies. (AHEP4, C6)	D	D	D	
7	Evaluate the environmental and societal impacts of electrical and electronic engineering solutions, focusing on minimizing adverse effects through sustainable and innovative practices. (AHEP4, C7, SDG12-15)			D	
8	Identify and address ethical concerns in electrical and electronic engineering practices, making informed decisions guided by professional codes of conduct and engineering standards. (AHEP4, C8, SDG16)				
9	Apply risk management processes to identify, evaluate, and mitigate risks in electrical and electronic engineering projects, with a focus on ensuring safety, resilience, and sustainable energy solutions. (AHEP4, C9)				D
10	Adopt holistic and proportionate approaches to mitigating security risks in electrical and electronic systems, ensuring robust and reliable designs. (AHEP4, C10)	A	A		

CLO No.	Course Learning Outcomes (CLOs) mapping against Level 4 Modules	RE4.1: Mechatronic Systems Engineering	RE4.2: Computer Aided Design	RE4.5: Electronic Circuit Design	RE4.6: Electrical Machinery and Drives
11	Adopt an inclusive approach to engineering practice, promoting equality, diversity, and inclusion in the design and implementation of electrical and electronic systems. (AHEP4, C11, SDG5,10)				
12	Utilise practical laboratory and workshop skills to investigate and solve complex problems in electrical and electronic engineering systems. (AHEP4, C12)	D		D	D
13	Select and apply appropriate materials, equipment, and technologies in electrical and electronic engineering, recognizing their limitations and ensuring efficient and sustainable practices. (AHEP4, C13)				D
14	Understand and apply quality management principles to ensure continuous improvement in electrical and electronic engineering systems and processes. (AHEP4, C14)				D
15	Apply engineering management principles, including project and change management, to electrical and electronic engineering projects, addressing legal considerations and intellectual property rights within a commercial context. (AHEP4, C15, SDG8)	D			
16	Demonstrate effective teamwork and leadership skills in collaborative engineering projects, contributing to shared objectives and successful outcomes. (AHEP4, C16, SDG17)		D		
17	Communicate complex engineering concepts effectively to diverse audiences, using appropriate technical and non-technical language. (AHEP4, C17)	D			D
18	Plan and document self-learning activities to support professional development and establish a foundation for lifelong learning. (AHEP4, C18, SDG4)	D	D		
19	Demonstrate a comprehensive understanding of the principles of STEAM, recognizing their interdisciplinary roles in addressing complex real-world challenges, with an emphasis on sustainability, ethics, creativity, and technical innovation, contributing to quality education. (STEAM)	D			
20	Apply STEAM knowledge collaboratively to design, evaluate, and present innovative solutions for complex problems, integrating technical, creative, and analytical skills while addressing interdisciplinary impacts and real-world challenges. (STEAM)		D		

CLO No.	Course Learning Outcomes (CLOs) mapping against Level 5 Modules			
	RE5.11 Intelligent Systems Engineering	RE5.3: Embedded Control Systems Design	RE5.7: Electrical Power Systems Engineering	RE5.10 Leadership for Engineering Excellence
1			D	
2	D			
3			D	
4	D		D	
5			D	A
6	D	D		
7	D			
8	D			A
9			D	
10				

CLO No.	Course Learning Outcomes (CLOs) mapping against Level 5 Modules	RE5.1 Intelligent Systems Engineering	RE5.3: Embedded Control Systems Design	RE5.7: Electrical Power Systems Engineering	RE5.10 Leadership for Engineering Excellence
11	Adopt an inclusive approach to engineering practice, promoting equality, diversity, and inclusion in the design and implementation of electrical and electronic systems. (AHEP4, C11, SDG5,10)		D		D
12	Utilise practical laboratory and workshop skills to investigate and solve complex problems in electrical and electronic engineering systems. (AHEP4, C12)		D	D	
13	Select and apply appropriate materials, equipment, and technologies in electrical and electronic engineering, recognizing their limitations and ensuring efficient and sustainable practices. (AHEP4, C13)	D	D		
14	Understand and apply quality management principles to ensure continuous improvement in electrical and electronic engineering systems and processes. (AHEP4, C14)				D
15	Apply engineering management principles, including project and change management, to electrical and electronic engineering projects, addressing legal considerations and intellectual property rights within a commercial context. (AHEP4, C15, SDG8)				D
16	Demonstrate effective teamwork and leadership skills in collaborative engineering projects, contributing to shared objectives and successful outcomes. (AHEP4, C16, SDG17)		A		A
17	Communicate complex engineering concepts effectively to diverse audiences, using appropriate technical and non-technical language. (AHEP4, C17)		D		A
18	Plan and document self-learning activities to support professional development and establish a foundation for lifelong learning. (AHEP4, C18, SDG4)				
19	Demonstrate a comprehensive understanding of the principles of STEAM, recognizing their interdisciplinary roles in addressing complex real-world challenges, with an emphasis on sustainability, ethics, creativity, and technical innovation, contributing to quality education. (STEAM)				A
20	Apply STEAM knowledge collaboratively to design, evaluate, and present innovative solutions for complex problems, integrating technical, creative, and analytical skills while addressing interdisciplinary impacts and real-world challenges. (STEAM)				A

CLO No.	Course Learning Outcomes (CLOs) mapping against Level 6 Modules	RE6.6: Communication Systems Design	RE6.7: Sustainable Energy and Smart Grid	RE6.3: Final Year Honours Project	RE6.4: Extended Final Year Honours Project	RE6.5: Engineering Micro/Virtual Placement
1	Apply knowledge of mathematics, statistics, natural science, and engineering principles to solve complex problems in electrical and electronic engineering, with applications in analogue and digital electronics, mechatronic systems, power systems, and communication technologies, contributing to sustainable industry innovation and infrastructure. (AHEP4, C1, SDG9)	A				
2	Systematically analyse complex electrical and electronic engineering problems, drawing on core concepts in analogue and digital electronics, intelligent systems and Internet of Things, sustainable energy and smart grids, to develop substantiated solutions. (AHEP4, C2, SDG7)		A			
3	Select and apply computational and analytical techniques to model and solve complex electrical and electronic engineering problems, with applications in computer aided design, electrical machinery, power systems, and communication systems, advancing innovation and resilient infrastructure. (AHEP4, C3, SDG9)	A		A		
4	Critically evaluate literature and technical resources to develop evidence-based solutions for complex electrical and electronic engineering problems in areas such as electronic circuit design, smart systems, electrical power and automation systems. (AHEP4, C4)			A		
5	Design solutions for complex engineering problems to meet societal, user, business, and customer needs, considering health and safety, diversity, inclusions, cultural, societal, environmental matters, codes of practice, and industry standards, contributing to sustainable cities and communities. (AHEP4, C5, SDG11)		A		A	A
6	Apply an integrated and systems-based approach to address complex problems in electrical and electronic engineering, with emphasis on embedded systems, Internet of Things applications, digital signal processing, control and automation technologies. (AHEP4, C6)	A				
7	Evaluate the environmental and societal impacts of electrical and electronic engineering solutions, focusing on minimizing adverse effects through sustainable and innovative practices. (AHEP4, C7, SDG12-15)			A		
8	Identify and address ethical concerns in electrical and electronic engineering practices, making informed decisions guided by professional codes of conduct and engineering standards. (AHEP4, C8, SDG16)			A	A	A
9	Apply risk management processes to identify, evaluate, and mitigate risks in electrical and electronic engineering projects, with a focus on ensuring safety, resilience, and sustainable energy solutions. (AHEP4, C9)		A	A	A	A

CLO No.	Course Learning Outcomes (CLOs) mapping against Level 6 Modules	RE6.6: Communication Systems Design	RE6.7: Sustainable Energy and Smart Grid	RE6.3: Final Year Honours Project	RE6.4: Extended Final Year Honours Project	RE6.5: Engineering Micro/Virtual Placement
10	Adopt holistic and proportionate approaches to mitigating security risks in electrical and electronic systems, ensuring robust and reliable designs. (AHEP4, C10)		A			
11	Adopt an inclusive approach to engineering practice, promoting equality, diversity, and inclusion in the design and implementation of electrical and electronic systems. (AHEP4, C11, SDG5,10)	A				
12	Utilise practical laboratory and workshop skills to investigate and solve complex problems in electrical and electronic engineering systems. (AHEP4, C12)	A	A			
13	Select and apply appropriate materials, equipment, and technologies in electrical and electronic engineering, recognizing their limitations and ensuring efficient and sustainable practices. (AHEP4, C13)	A	A			
14	Understand and apply quality management principles to ensure continuous improvement in electrical and electronic engineering systems and processes. (AHEP4, C14)	A				
15	Apply engineering management principles, including project and change management, to electrical and electronic engineering projects, addressing legal considerations and intellectual property rights within a commercial context. (AHEP4, C15, SDG8)			A	A	A
16	Demonstrate effective teamwork and leadership skills in collaborative engineering projects, contributing to shared objectives and successful outcomes. (AHEP4, C16, SDG17)		A			
17	Communicate complex engineering concepts effectively to diverse audiences, using appropriate technical and non-technical language. (AHEP4, C17)			A		
18	Plan and document self-learning activities to support professional development and establish a foundation for lifelong learning. (AHEP4, C18, SDG4)			A		
19	Demonstrate a comprehensive understanding of the principles of STEAM, recognizing their interdisciplinary roles in addressing complex real-world challenges, with an emphasis on sustainability, ethics, creativity, and technical innovation, contributing to quality education. (STEAM)		A			
20	Apply STEAM knowledge collaboratively to design, evaluate, and present innovative solutions for complex problems, integrating technical, creative, and analytical skills while addressing interdisciplinary impacts and real-world challenges. (STEAM)		A			