COURSE SPECIFICATION

MEng Electrical and Renewable Energy Engineering

Quality Assurance, Academic Standards and Partnerships
Department of Student and Academic Administration

COURSE SPECIFICATION

Course Title	Electrical and Renewable Energy Engineering
Final Award	MEng
Exit Awards	CertHE, DipHE and BEng
Course Code / UCAS code (if applicable)	U3092PYC/H600
Mode of study	Full time with placement
Mode of delivery	Campus
Normal length of course	4 years, 5 years with placement
Cohort(s) to which this course specification applies	from September 2020 intake onwards
Awarding Body	University of Portsmouth
Teaching Institution	University of Portsmouth
Faculty	Faculty of Technology
School/Department/Subject Group	School of Energy and Electronic Engineering
School/Department/Subject Group webpage	School of Energy and Renewable Engineering
Course webpage including entry criteria	BEng/MEng Electrical and Renewable Energy Engineering
Professional and/or Statutory Regulatory Body accreditations	None
Quality Assurance Agency Framework for Higher Education Qualifications (FHEQ) Level	level 7

This course specification provides a summary of the main features of the course, identifies the aims and learning outcomes of the course, the teaching, learning and assessment methods used by teaching staff, and the reference points used to inform the curriculum.

This information is therefore useful to potential students to help them choose the right course of study, to current students on the course and to staff teaching and administering the course.

Further detailed information on the individual modules within the course may be found in the relevant module descriptors and the Course Handbook provided to students on enrolment.

Please refer to the Course and Module Catalogue for further information on the course structure and modules.

Educational aims of the course

The course aims to equip students to work as engineers in the fields of power systems technology, energy systems and management, renewable and sustainable energy, electrical machines and power electronics. Electrical and Energy Engineers are problem solvers working at the forefront of technological innovation: from robotics and AI to large-scale electrical distribution networks and various energy efficient systems. They work in industry, the government, and in research and development settings. They are involved in leading-edge research, creating new ideas as well as designing and developing new products and technologies. In addition, and more generally:

- *Provide a challenging and stimulating study environment.*
- *Develop a range of key skills by means of opportunities provided in the study modules.*
- *Accommodate student needs in relation to maximising their career potential by enabling them to develop knowledge, understanding and skills in their chosen subject area.*

Students are encouraged and expected to be able to reach a level of competence and professionalism where they can effectively integrate their technical and non-technical knowledge to solve a range of problems of a complex nature. The course enables students to develop both analytical and design skills across the range of subjects. This is achieved through theoretical studies alongside practical design projects and laboratory experiments. Students also become conversant with industrial practice and familiar with industrial strength analysis and various simulation tools. Rapid advancements in areas of electrical, renewable and alternative Energy Systems make pursuing a degree combining these areas of expertise an especially strategic choice in today's world. Electrical and Renewable Energy Engineering is one of the most in-demand professions in the UK, with vacancies set to rise significantly come the turn of the decade.

On this course, students will examine the theory and design of Electrical systems as well as such modules covering various aspects of Energy conversion & storage technology, low carbon heating systems, solar energy systems and advanced battery technologies. You will get hands on experience with sophisticated facilities and put your skills to work in practice. The electrical engineering part of the course will deal with Electrical circuit analysis, harnessing electricity, producing, delivering, storing and transmitting it, as well automating the process of managing into the grid and homes. This includes large-scale electricity networks that distribute and control power, and how electricity of high-voltage and/or current strength flows from one point to another. High-voltage with strong current applications and management in large network grids, and sub-stations / stations is also be addressed. The course will also cover many important aspects of energy technology and management.

Course Learning Outcomes and Learning, Teaching and Assessment Strategies

The Quality Assurance Agency for Higher Education (QAA) sets out a national framework of qualification levels, and the associated standards of achievement are found in their Framework for Higher Education Qualifications document.

The Course Learning Outcomes for this course are outlined in the tables below.

A. Knowledge and understanding of:

LO number	Learning outcome	Learning and Teaching methods	Assessment methods
A1	*A comprehensive understanding of Advanced battery and fuel cell technologies, Renewable and alternative energy, smart grid technology, Electrical power systems technology, Engineering management, economics and risk analysis, Sustainable transport systems, Energy efficient buildings, Control systems analysis and design, Artificial intelligence, Low carbon*	*Lectures, seminars, laboratory work, group work and simulations.*	*Examinations, coursework, practical assessments, project reports.*

LO number	Learning outcome	Learning and Teaching methods	Assessment methods
	heating systems, Energy systems, Analogue and digital systems, Innovation and enterprise.		
A2	*Appropriate mathematical methods*	*Lectures, tutorials, laboratory activities, simulation*	Coursework, Exam
A3	*The role of computing and simulation in the solution of problems, including hardware description languages*	*laboratory activities*	Coursework, report
A4	*Practical design of electronic, Electrical and software systems*	*Lectures, tutorials, laboratory activities*	Coursework, exam
A5	*The business context of engineering: commercial, legal, contractual and statutory frameworks*	*Lectures*	Examinations, coursework
A6	*Professional and ethical responsibility*	*Lectures, seminars, laboratory work, group work and simulations.*	Coursework, project reports

B. Cognitive (Intellectual or Thinking) skills, able to:

LO number	Learning outcome	Learning and Teaching methods	Assessment methods
B1	*Select, acquire and apply appropriate knowledge of communications, electronic, software, computer and principles to model and analyse systems*	*Lectures, seminars, laboratory work, group work and simulations.*	*Examinations, coursework, practical assessments, project reports.*
B2	Select and apply appropriate mathematical methods to model, analyse, plan or program electronic systems	*Lectures, tutorials, laboratory activities, simulation*	*Examinations, coursework, report.*
B3	Select and apply computer-based design and simulation techniques	*Lectures, tutorials, laboratory activities, simulation*	*Coursework, exam, report*
B4	Design, build and test systems and subsystems to meet specified sometimes conflicting requirements	*Lectures, tutorials, laboratory activities, simulation*	*Coursework, report*

LO number	Learning outcome	Learning and Teaching methods	Assessment methods
B5	Assess electronic, software and computer systems from commercial and statutory viewpoints, including assessment of risks	*Lectures, tutorials, laboratory, simulation*	*Coursework, report, presentation*
B6	Solve problems in a systematic and manageable manner	Lectures, tutorials, laboratory, simulation	Coursework, report, presentation

C. Practical (Professional or Subject) skills, able to:

LO number	Learning outcome	Learning and Teaching methods	Assessment methods
C1	Use standard and specialist laboratory instruments, conduct experiments and report on them	*Lectures, laboratory activities, simulation*	*Laboratory, Coursework, report*
C2	Use computer-based simulation, design and software development tools	*Lectures, laboratory activities, simulation*	*Laboratory, Coursework, report*
C3	Design, construct, test and evaluate electronic circuits and Electrical and Energy systems	*Lectures, laboratory activities*	*Laboratory, Coursework, report*
C4	Search a range of sources for information pertinent to technical and professional tasks	*Lectures, laboratory activities, simulation*	*Laboratory, Coursework, report*
C5	Plan, manage and undertake a range of engineering projects, taking into account constraints	*Lectures, laboratory activities*	*Coursework, report*

D. Transferrable (Graduate and Employability) skills, able to:

LO number	Learning outcome	Learning and Teaching methods	Assessment methods
D1	Manipulate and present information	*Lectures, group work*	*Laboratory, Coursework, presentation, report*
D2	Analyse scientific and technical information in the solution of problems	*Lectures, laboratory activities, group work*	*Coursework, presentation, report*
D3	Use information technology to handle text and data and for simulation and design	*Lectures, laboratory activities*	*Exam, Coursework, presentation*

LO number	Learning outcome	Learning and Teaching methods	Assessment methods
D4	Develop solutions in a creative manner, sometimes based on inadequate information	*Lectures, laboratory activities*	*Exam, Coursework, presentation*
D5	Communicate effectively in a variety of formats	*Lectures, laboratory activities*	*Exam, Coursework, presentation, report*
D6	*Work effectively as an individual and as part of a team to achieve goals*	*laboratory activities, group work*	*Coursework, presentation, report*

Academic Regulations

The current University of Portsmouth Academic Regulations will apply to this course.

Support for Student Learning

The University of Portsmouth provides a comprehensive range of support services for students throughout their course, details of which are available at the MyPort student portal.

In addition to these University support services this course also provides:

· Extensive induction programme introduces students to the University and their course.

· Each student has a personal tutor, responsible for pastoral support and guidance.

· Industrial placement tutors

· Subject lecturers offer drop-in tutorial sessions every week for students to seek further support and guidance with their work.

· The School offers excellent experimental up-to-date facilities that are also available to students for extracurricular activities. These include:

- The Power Engineering Laboratory
- The Energy Engineering Laboratory
- The Digital Electronics and Microprocessor Laboratory
- The Analogue Electronics Laboratory
- The Control Engineering Laboratory
- The Telecommunications and Digital Signal Processing Laboratory
- The Computer Suites (Linux and Windows)

· The School offers student led surgeries in the areas of electronics and computing.

· The School has an Industrial Liaison Officer whose particular role is to maintain contact with employers, although most staff maintain good industrial and research links.

· The Faculty Student Placement and Employability Centre (SPEC) office offers a wide range of guidance and support to students to enable them to secure placements.

Evaluation and Enhancement of Standards and Quality in Learning and Teaching

The University of Portsmouth undertakes comprehensive monitoring, review and evaluation of courses within clearly assigned staff responsibilities. Student feedback is a key feature in these evaluations, as

represented in our Policy for Listening to and Responding to the Student Voice where you can also find further information.

Reference Points

The course and outcomes have been developed taking account of:

- University of Portsmouth Curriculum Framework Specification
- University of Portsmouth Strategy
- University of Portsmouth Code of Practice for Work-based and Placement Learning
- Quality Assurance Agency UK Quality Code for Higher Education
- Quality Assurance Agency Qualification Characteristic Statements
- Quality Assurance Agency Subject Benchmark Statement for ***Engineering***
- Quality Assurance Agency Framework for Higher Education Qualifications
- Vocational and professional experience, scholarship and research expertise of the University of Portsmouth's academic members of staff
- National Occupational Standards

Disclaimer

The University of Portsmouth has checked the information provided in this Course Specification and will endeavour to deliver this course in keeping with this Course Specification. However, changes to the course may sometimes be required arising from annual monitoring, student feedback, and the review and update of modules and courses.

Where this activity leads to significant changes to modules and courses there will be prior consultation with students and others, wherever possible, and the University of Portsmouth will take all reasonable steps to minimise disruption to students.

It is also possible that the University of Portsmouth may not be able to offer a module or course for reasons outside of its control, for example, due to the absence of a member of staff or low student registration numbers. Where this is the case, the University of Portsmouth will endeavour to inform applicants and students as soon as possible, and where appropriate, will facilitate the transfer of affected students to another suitable course.

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Document details

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