

# Programme Specification for Postgraduate Programme Leading to: MSc in Sustainable Electrical Power



Applicable for all postgraduate students starting on or after 1<sup>st</sup> September 2021

<u>Version No.</u>	<u>Date</u>	<u>Notes – QA USE ONLY</u>	<u>QAM/O</u>
2021-22 v1	13 August 2021	Programme specification for 2021/22 entrants.	JP

Postgraduate Taught Programmes	
1. Awarding institution	Brunel University London
2. Teaching institution(s)	Brunel University London
3. Home college/department/division	College of Engineering, Design and Physical Sciences/ Dept of Electronic and Electrical Engineering
4. Contributing college/department/division /associated institution	None
5. Programme accredited by	Energy Institute (EI). EI accreditation for the 2021/22 intake only.
6. Final award(s) and FHEQ Level of Award	MSc Sustainable Electrical Power FHEQ Level 7
7. Programme title	MSc Sustainable Electrical Power
8. Programme type (Single honours/joint)	N/A
9. Normal length of programme (in months) for each mode of study	FT: 12 Months PT: 24 Months
10. Maximum period of registration for each mode of study	FT: Normal period of study plus two years up to a maximum of five years PT: Normal period of study plus two years up to a maximum of five years
11. Variation(s) to September start	No
12. Modes of study	FT, PT
13. Modes of delivery	Standard (modular block mode)
14. Intermediate awards, titles and FHEQ level of award	Postgraduate Diploma in Sustainable Electrical Power - FHEQ Level 7  Postgraduate Certificate in Sustainable Electrical Power - FHEQ Level 7
15. UCAS Code	N/A
16. HECoS Code	100581
17. Route Code	H630PSSUELPW

18. Relevant subject benchmark statements and other external and internal reference points used to inform programme design	<a href="#">UK Quality Code for Higher Education</a> which includes the English Framework for Higher Education Qualifications within Part A on Setting and Maintaining Academic Standards <a href="#">QAA Subject Benchmark Statement</a> (Engineering) <a href="#">Brunel University London 2030</a> Brunel Placement Learning Policy, as published under the 'Placements' section of the ' <a href="#">Managing Higher Education Provision with Others</a> ' page.
19. Admission Requirements	Details of <a href="#">PGT entry requirements</a> are provided on the University's and College website. Levels of English for non-native speakers are outlined on Brunel International's <a href="#">language requirements</a> pages.
20. Other relevant information (e.g. study abroad, additional information on placements)	N/A
21. Programme regulations not specified in Senate Regulation 3. Any departure from regulations specified in Senate Regulation 3 must be stated here and approved by Senate.	N/A
22. Further information about the programme is available from the College website.	<a href="#">MSc in Sustainable Electrical Power</a>

### 23. EDUCATIONAL AIMS OF THE PROGRAMME

The aim of this programme is to produce graduates with advanced knowledge and skills in the engineering, design and management of sustainable electrical power systems, such that they can contribute effectively to the increasingly complex and rapidly evolving technologies that are prevalent in the electricity industry.

### 24. PROGRAMME AND INTERMEDIATE LEARNING OUTCOMES

The programme provides opportunities for students to develop and demonstrate knowledge and understanding (K) cognitive (thinking) skills (C) and other skills and attributes (S) in the following areas:

Level	Category (K = knowledge and understanding, C = cognitive (thinking) skills, S = other skills and attributes)	Learning Outcome	Masters Only	Associated Assessment Blocks Code(s)	Associated Study Blocks Code(s)	Associate and Modular Blocks Code(s)
7	K	Comprehensive Knowledge and Understanding of the terminology and concepts of sustainable electrical power.				EE5518 EE5519 EE5520 EE5521 EE5522 EE5523 EE5524, EE5500
	K	Comprehensive Knowledge and Understanding of advanced power system analysis techniques.				EE5519 EE5520 EE5519 EE5521. EE5500

	<b>K</b>	Comprehensive Knowledge and Understanding of current and emerging technologies for sustainable energy.				EE5523 EE5524 EE5518 EE5500
	<b>K</b>	Comprehensive Knowledge and Understanding of current economic procedures for operating, analysing and designing power markets.				EE5518 EE5523
	<b>K</b>	Knowledge and Understanding of state-of-the-art power system operation and management techniques.				EE5522 EE5523
	<b>K</b>	Comprehensive Knowledge and Understanding of advance power electronics and Flexible AC Transmission Systems.				EE5523 EE5519
	<b>K</b>	Knowledge and Understanding of prevalent and emerging technologies for sustainable power generation.				EE5523 EE5524
	<b>K</b>	Knowledge and Understanding of algorithmic procedures for analysing power flows and system security.				EE5520 EE5523
	<b>K</b>	Comprehensive Knowledge and Understanding of effective procedures for controlling the stability of sustainable electrical power systems.				EE5521 EE5523
	<b>K, S</b>	Awareness of professional and ethical responsibility related their field to effectively perform their engineering activities				EE5625 EE5524 EE5523 EE5500

	<b>C</b>	Able to recognise solutions appropriate for sustainable electrical power systems.				EE5518 EE5519 EE5520 EE5521 EE5522 EE5523 EE5524 EE5500
	<b>C</b>	Able to employ state-of-the-art software tools and techniques to investigate and design sustainable electrical power systems.				EE5518 EE5519 EE5520 EE5521 EE5523 EE5500
	<b>C</b>	Able to review and draw conclusions from current literature in a technically complex area.	√			EE5500
	<b>C</b>	Able to plan, execute and evaluate a significant investigation into a current problem area.				EE5523 EE5500
	<b>S</b>	Able to work effectively in a team.				EE5523 EE5518
	<b>S</b>	Able to present complex issues and arguments in both written and oral forms.				EE5625 EE5518 EE5519 EE5520 EE5521 EE5522 EE5523 EE5524 EE5500
	<b>S</b>	Able to write up a research investigation in a concise and coherent document, conveying the main conclusions to a non-specialist audience.	√			EE5500

**Learning/teaching strategies and methods** to enable learning outcomes to be achieved, including formative assessments

Knowledge and understanding in the areas indicated and the cognitive skills are acquired through a mix of lectures, workshops, seminars, self-study, and individual and group project work. In lectures key concepts and ideas are introduced, definitions are stated, techniques are explained, and immediate student queries discussed. Seminars provide the students with the opportunity to discuss at greater length issues arising from lectures. Workshops sessions are used to foster practical engagement with the taught material.

The dissertation project plays a more significant role in supporting literature review in a technically complex area and to plan, execute and evaluate a significant investigation into a current problem area.

Other skills and attributes are developed primarily through completion of carefully designed lab exercises, completion of group assignments, and through the dissertation project.

**Summative assessment strategies and methods** to enable learning outcomes to be demonstrated.

A variety of assessment methods are used. A final unseen examination features heavily in the more theoretical modules, and is a major component in the assessment of most knowledge and understanding and cognitive skills. Written assignments are also used to assess some learning outcomes.

Literature review and planning, executing and evaluating a significant investigation into a current problem area is assessed particularly in the dissertation.

Team work, presentation in written and oral forms and employment of state of the art simulation software to investigate and evaluate design solutions are assessed in the workshops modules in the form of assignments. The EE5523 workshop comprises a series of labs assessed by written reports.

## 25. Programme Structure, progression and award requirements

Programme structures and features: levels, assessment blocks, credit and progression and award requirements

- **Compulsory block:** one which all students registered for the award are required to take as part of their programme of study. These will be listed in the left hand column;
- **Optional block:** one which students choose from an 'option range'. These will be listed in the right hand column;
- A **core assessment** is an assessment identified within an assessment block or modular block (either compulsory or optional) which must be passed (at grade C- or better) in order to be eligible to progress and to be eligible for the final award. All core assessments must be specified on the programme specification next to the appropriate assessment or modular block:

Where students are expected to pass the block at C- or better, but not necessarily all elements, then the block itself is core.

e.g. AB5500 Project (40)  
Core: Block

Where only some elements of assessments are required to be passed at C- or better, these will be identified by listing each element that is core

e.g. ABXXX1 Title (XX credits)  
Core: 1 & 4

Where students are expected to pass all assessments in a block then this will be identified. By setting the assessment this way, students are also required to pass the block by default. This will be identified thus:

e.g. ABXXXX Title (XX credits)  
Core: All, Block

- A **non-core assessment** does not have to be passed at grade C- or better, but must D- or better in order to be eligible for the final award.

Level 7	
<b>Compulsory assessment block codes, titles and credit</b>	<b>Optional assessment block codes, titles and credits</b>
<b>Compulsory study block codes, titles and credit volume</b>	<b>Optional Study block codes, titles and credit volume</b>
<p><b>Compulsory modular block codes, titles and credits</b></p> <p>EE5518 Energy Economics and Power Markets (15 credits)            EE5519 Power Electronics and FACTS (15 credits)            EE5520 Power System Analysis and Security (15 credits)            EE5521 Power System Stability and Control (15 credits)            EE5522 Power System Operation and Management (15 credits)            EE5523 SEP Workshop (15 credits)            EE5524 Sustainable Power Generation (15 credits)            EE5625 Engineering Ethics and Sustainability (15 credits)</p> <p>EE5500 Project and Dissertation (60 credits)  <b>Core: Block</b></p> <p>Part Time:            Year 1: EE5520, EE5521, EE5522, EE5524, EE5625            Year 2: EE5518, EE5519            Year 1 &amp; 2: EE5523 and EE5500</p>	
<p><b>Level 7 Progression and Award Requirements</b></p> <p><a href="#"><u>As per Senate Regulation 3</u></a></p> <p>A PGDip may be awarded by substitution of the dissertation (EE5500) for up to 30 credits of modular/assessment blocks in the taught part of the programme, provided the learning outcomes have been met.</p>	
<p>Please note: this specification provides a concise summary of the main features of the programme and the learning outcomes that a student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods can be found in the modular block, assessment and study block outlines and other programme and block information. The accuracy of the information contained in this document is reviewed by the University from time to time and whenever a modification occurs.</p>	