

**Programme Specification for Programme Leading to:
MSc Advanced Electronic and Electrical Engineering**



Applicable for all postgraduate students starting on or after 1st September 2022

<u>Version No.</u>	<u>Date</u>	<u>Notes – QA USE ONLY</u>	<u>QAM</u>
2022-23 v1	01/06/2022	New specification created for 2022/23, new intermediate award added, variation to SR3 added, new LOs to meet AHEP4, EE5629 removed, EE5633 added	SK

Masters programme	
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	Institution of Engineering Technology
6. Final award(s) and FHEQ Level of Award	MSc Advanced Electronic and Electrical Engineering FHEQ Level 7
7. Programme title	MSc Advanced Electronic and Electrical Engineering
8. N/A	
9. Normal length of programme (in months) for each mode of study	12 Months (September intake) 14 Months (January intake)
10. Maximum period of registration for each mode of study	Normal or standard duration plus 2 years (up to a maximum of five years)
11. Variation(s) to September start	January 2022 subject to review thereafter.
12. Modes of study	Full Time
13. Modes of delivery	Standard
14. Intermediate awards, titles and FHEQ Level of Award	Postgraduate Certificate in Advanced Electronic and Electrical Engineering - FHEQ Level 7 Postgraduate Diploma in Advanced Electronic and Electrical Engineering - FHEQ Level 7 MSc Engineering(Electronic and Electrical) – FHEQ Level 7
15. UCAS Code	N/A
16. JACS / HECOS Code	H610 /100165
17. Route Code	H610PADVEENG
18. Relevant subject benchmark statements and other external and internal reference points used to inform programme design	UK Quality Code for Higher Education QAA Subject Benchmark Statement (Engineering) Brunel University London 2030 Brunel Placement Learning Policy, as published under the 'Placements' section of the ' Managing Higher Education Provision with Others ' page.

19. Admission Requirements	Details of PGT entry requirements are provided on the University's and College website. Levels of English for non-native speakers are outlined on Brunel International's language requirements 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.	For an accredited award, students may not be allowed an aegrotat pass on any module or have more than 20 credits of allowed failure (D-, D or D+) throughout their entire profile. To achieve a C- grade or better in any block students must not have a grade below D- in assessment elements weighted 30% or above
22. Further information about the programme is available from the College website.	MSc Advanced Electronic and Electrical Engineering

23. EDUCATIONAL AIMS OF THE PROGRAMME

The primary aim of this programme is to produce MSc graduates with advanced and broad knowledge and skills relevant to a demanding and dynamic electronic and electrical engineering sector i.e., sensors and instrumentation, control systems, photonics, power electronics with applications to sustainable power systems, telecommunications, intelligent systems, medical systems, integrated circuits and embedded systems.

Specific aims are as follows:

- 1) To develop in-depth knowledge in electrical and electronics engineering issues that will help to deal with new, complex and unusual challenges across a range of electrical and electronics issues..
- 2) To develop imagination, initiative and creativity to enable graduates for problem solving.

To provide a pathway that will prepare graduates for successful careers with national and international organisations including, where appropriate, progression to Chartered Engineer status.

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)	Associated Modular Blocks Code(s)
7 M1	K,C	Apply a comprehensive knowledge of mathematics, natural science and engineering principles to the solution of complex electronic and electrical engineering problems with much of the				EE5632, EE5500, EE5550, EE5566, EE5622, EE5625, EE5624, EE5626, EE5627, EE5628,

		knowledge at the forefront of their study informed by a critical awareness of new developments and the wider context of engineering				EE5630.
M2	C	Formulate and analyse complex problems in electronic and electrical engineering to reach substantiated conclusions including using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed				EE5632, EE5633, EE5500, EE5550, EE5566, EE5622, EE5624, EE5626, EE5627, EE5628. EE5630
M3	C, S	Select and apply appropriate computational and analytical techniques to model complex electronic and electrical engineering problems, discussing the limitations of the techniques employed.				EE5632, EE5633, EE5550, EE5566, EE5624, EE5626, EE5627, EE5630
M4	C, S	Select and critically evaluate technical literature and other sources of information to solve complex electronic and electrical engineering problems.				EE5632, EE5633, EE5500, EE5566, EE5622, EE5626, EE5627, EE5630
M5	C, S	Design solutions for complex electronic and electrical engineering problems that evidence some originality and meet a combination of societal, user, business and customer needs as appropriate.				EE5500, EE5625, EE5550, EE5624, EE5626, EE5627, EE5628. EE5633, EE5630
M7	C, S	Evaluate the environmental and societal impact of solutions to complex electronic and electrical engineering problems (to include the entire life-cycle of a product or process) and minimise adverse impacts				EE5500, EE5625, EE5630, EE5633
M16	C,S	Function effectively in a team and evaluate effectiveness of own and team performance.				EE5632, EE5626, EE5628, EE5630
M17	C,S	Communicate effectively on complex electronic and electrical engineering matters with technical and non-technical audiences,				EE5632, EE5626, EE5500

		evaluating the effectiveness of the methods used.				
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	Learning/teaching strategies and methods to enable learning outcomes to be achieved, including formative assessments
	<ul style="list-style-type: none"> • Knowledge and understanding in the areas indicated 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. • Team work, effective communication, critical review and research skills 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.
	<p>Assessment will allow students to demonstrate their abilities in a range of styles relevant to professional Electrical and Electronics Engineers. These will include:</p> <ul style="list-style-type: none"> • Essays and reports – demonstration of depth and breadth of knowledge and written communication skills • Technical analytical reports – ability to collect, analyse and interpret a range of evidence, including in the laboratory • Group report – contribution as a team member to a collaborative challenge • Formal examinations – ability to quickly formulate arguments and solve problems • Dissertation – ability to plan, critically review, execute and communicate an advanced piece of research – EE5500, the Dissertation specification, requires students to undertake research relevant to their specific programme. <p>Deadlines will be distributed through the year, allowing time for constructive feedback.</p>

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.

FHEQ Level 7	
Compulsory assessment block codes, titles and credit	Optional assessment block codes, titles and credits
<p><u>September Start</u></p> <p><u>Autumn Term</u></p> <p>EE5566 Advanced Analogue Electronics & Photonics (15 Credits)</p> <p>EE5624 Applied sensors, instrumentation and control (15 Credits)</p> <p>EE5500 Project and Dissertation (60 credits – Core Block)</p> <p><u>Spring Term</u></p> <p>EE5626 AEEE Group Project (15 credits)</p> <p>EE5632 Power Electronics and Drives (15 Credits)</p> <p>EE5625 Engineering Ethics and Sustainability (15 Credits)</p> <p>EE5500 Project and Dissertation (60 credits – Core Block)</p>	<p><u>September Start</u></p> <p>Students choose 45 credits from the following,</p> <p><u>Autumn Term</u></p> <p>EE5630 Advanced Embedded Systems Design (15 Credits)</p> <p>EE5627 Artificial Intelligence System Techniques (15 Credits)</p> <p>EE5622 Communication Network Technologies (15 Credits)</p> <p><u>Spring Term</u></p> <p>EE5628 Embedded DSP for Communications (15 Credits)</p> <p>EE5550 RF & Optical Communication Systems (15 Credits)</p> <p>EE5633 Smart Grid Operation and Management</p>

