

Programme Specification for Postgraduate Programme Leading to: MSc in Advanced Mechanical Engineering



Applicable for all postgraduate students starting in 2021

<u>Version No.</u>	<u>Date</u>	<u>Notes – QA USE ONLY</u>	<u>QA</u>
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Postgraduate Taught 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/ Department of Mechanical and Aerospace Engineering
4. Contributing college/department/division /associated institution	None
5. Programme accredited by	Institution of Mechanical Engineers
6. Final award(s) and FHEQ Level of Award	MSc Advanced Mechanical Engineering FHEQ Level 7
7. Programme title	MSc Advanced Mechanical Engineering
8. Programme type (Single honours/joint)	N/A
9. Normal length of programme (in months) for each mode of study	FT 12 months
10. Maximum period of registration for each mode of study	The normal length of programme plus two years up to a maximum of five years
11. Variation(s) to September start	N/A
12. Modes of study	Full-time
13. Modes of delivery	On-campus, standard
14. Intermediate awards, titles and FHEQ Level of Award	PGDip in Advanced Mechanical Engineering - FHEQ Level 7 PGCert in Advanced Mechanical Engineering - FHEQ Level 7
15. UCAS Code	N/A
16. HECoS Code	100190
17. Route Code	H300PADVME
18. Relevant subject benchmark statements and other external and internal reference points used to inform programme design	<p>UK Quality Code for Higher Education QAA Subject Benchmark Statement (Engineering) Brunel 2030 Brunel Placement Learning Policy, as published under the 'Placements' section of the 'Managing Higher Education Provision with Others' page.</p> <p>IMechE Position Statement on UK-SPEC. IMechE Degree Accreditation Information for Universities Engineering Council, UK-SPEC document "Chartered Engineer and Incorporated Engineer Standard"</p>

19. Admission Requirements	Details of 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.	N/A
22. Further information about the programme is available from:	Course webpage

23. EDUCATIONAL AIMS OF THE PROGRAMME

This major course in Mechanical Engineering will develop the student's knowledge, understanding and skills in the subjects related to the discipline. With close links to both the existing MEng course and the significant research in the School, the programme develops breadth and depth of knowledge and understanding. Modules in management and research methodology give breadth, while computational methods and CAD provide students with leading edge technology. The elective themes of thermofluids and solid body mechanics provide students with ideal skills to solve real-world engineering problems. Graduates will have expertise in techniques, and an understanding of the underlying physical, physiological and economic factors in Advanced Mechanical Engineering.

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 7	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)
	K	1. Knowledge and understanding of the advanced theoretical basis underpinning principles, current problems and new insights in the field of either solid body mechanics or thermofluids				ME5554 ME5504 ME5557 ME5535 ME5506 ME5629
	K	2. Knowledge and understanding of the processes supporting the techniques applicable to research.				ME5571 ME5554 ME5557 ME5535 ME5629
	K	3. Knowledge and understanding of the principles underlying advanced computational methods applied to mechanical engineering.				ME5542 ME5554 ME5504 ME5535 ME5629
	K	4. Knowledge and understanding of the demands of implementing management in an innovative engineering environment.				ME5571 ME5641 ME5542

	K	5. Knowledge and understanding of complex and advanced engineering design/application in either solid body mechanics or thermofluids.				ME5542 ME5554 DM5563 ME5506 ME5521
	C	6. Systematically evaluate the appropriate techniques for the solution of engineering problems				ME5554 ME5557 ME5504 DM5563 ME5535 ME5506 ME5521 ME5629
	C	7. Identify and analyse the complex design requirements for an engineering problem.				ME5542 MN5562 ME5521 DM5563
	C	8. Critically evaluate the performance and design of existing engineering solutions.				ME5542 ME5504 DM5563 ME5521 ME5629
	C	9. Plan, and comprehensively appraise personal projects.	x			ME5500
	C	10. Identify and apply complex codified data and specifications.	x			ME5571 ME5500
	C	11. Assemble and critically analyse cutting edge and innovative primary, secondary and incomplete data.	x			ME5500
	C	12. Critically evaluate and apply investigative techniques that are appropriate to the project.	x			ME5500
	C	13. Evaluate critically current research to develop a thesis by presenting a coherent argument	x			ME5500
	S	14. Design and implement advanced engineering systems.				MN5562 ME5554 ME5557 ME5504 DM5563 ME5535 ME5506 ME5521 ME5629
	S	15. Define and organise a substantial investigation that is informed by the field of study through advanced study	x			ME5500
	S	16. Appraise and critically evaluate appropriate research methods	x			ME5571 ME5500
	S	17. Systematically and creatively consolidate and present technical information into a concise, coherent document	x			ME5500
	S	18. Employ complex and conventional methods of technical communication	x			ME5500

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

Knowledge-and-understanding learning outcomes

The fundamental principles of the learning outcomes are taught through lectures and seminars.
Laboratory experiments support learning outcome 1 allowing students to demonstrate and apply key approaches
Learning outcomes 2, 3, 4 and 5 are acquired through summative coursework.
Self-study and research will underpin the teaching and learning objectives.

Material will be delivered to allow students to both broaden and deepen their engineering knowledge. The core modules provide students with fundamental principles that covers the breadth of material of this programme needed for this award while the specialist options provide students with opportunities to develop advanced and specific knowledge of their chosen stream.

Cognitive skills

Skills 6-12 are taught in lectures, and acquired through a combination of projects and assignments: other skills are acquired through the competent production of coursework assignments; and, for skill 3, through design appraisal project work.
Skill 13 is acquired through the development of an individual dissertation.

Other skills and attributes

Skills 14, 17 and 18 are acquired through the undertaking and the presentation of coursework assignments.
Many of the skills are acquired through the dissertation project. Namely, skills 16 and 17 through the literature search and review, skills 15-18 through the preparation of the dissertation. Again, self-study and research will underpin the teaching and learning objectives

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

Knowledge-and-understanding learning outcomes

The outcomes are assessed using a range of methods that allow students to demonstrate their knowledge and understanding of the subject area through a combination of written assignments and unseen written exams as specified in the module details . Written work and examinations will provide students with the opportunity to demonstrate their ability to apply knowledge and understanding.

Cognitive skills

Skills are assessed using written coursework in addition to:
project reports and unseen written examinations including problem solving tasks.
Skills 4,6,7 and 8 are assessed through the dissertation project.

Other skills and attributes

All of the skills are assessed using written coursework including technical project reports. Additionally, skills 2-5 are assessed through the dissertation and skill 1 is assessed using unseen written examinations.

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
Compulsory study block codes, titles and credit volume	Optional Study block codes, titles and credit volume
<p>Compulsory modular block codes, titles and credits</p> <p>MN5562 Computer Aided Engineering 1 (15 credits)</p> <p>ME5641 Strategy and Business Planning (15 credits)</p> <p>ME5571 Research Methods and Sustainable Engineering (15 credits)</p> <p>ME5542 Advanced Modelling and Design (15 credits)</p> <p>ME5500 Dissertation (60 credits) Core: Block</p>	<p>Optional modular block codes, titles and credits</p> <p>Students should choose one of the two themes below.</p> <p><u>Theme A – Solid Body Mechanics</u></p> <p>ME5504 Structural Design and FEA (15 credits)</p> <p>DM5563 Human Factors in Design (15 credits)</p> <p>ME5554 Advanced Solid Body Mechanics (15 credits)</p> <p>ME5557 Dynamics and Modal Analysis (15 credits)</p> <p><u>Theme B – Thermofluids</u></p> <p>ME5506 Energy Conversion Technologies (15 credits)</p> <p>ME5521 Renewable Energy Technologies (15 credits)</p> <p>ME5535 Advanced Thermofluids (15 credits)</p> <p>ME5629 Principles of Heat and Mass Transfer (15 credits)</p>
<p>FHEQ Level 7 Progression and Award Requirements</p> <p>As per Senate Regulation 3</p> <p>A PGDip may be awarded by substitution of the dissertation (ME5500) for up to 30 credits of modular/assessment blocks in the taught part of the programme, provided the learning outcomes have been met.</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.