

Programme Specification for Postgraduate Programme Leading to: MSc in Aerospace Engineering



Applicable for all postgraduate students starting in 2021

<u>Version No.</u>	<u>Date</u>	<u>Notes – QA USE ONLY</u>	<u>AO</u>
2021-22 v1	13 August 2021	Programme Specification updated for 2020/21 entrants.	JP

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/ Dept of Mechanical and Aerospace Engineering
4. Contributing college/department/division /associated institution	None
5. Programme accredited by	Institution of Mechanical Engineers (IMechE) Royal Aeronautical Society
6. Final award(s) and FHEQ Level of Award	MSc Aerospace Engineering FHEQ Level 7
7. Programme title	MSc Aerospace Engineering
8. Programme type (Single honours/joint)	N/A
9. Normal length of programme (in months) for each mode of study	12 months
10. Maximum period of registration for each mode of study	The normal length of programme plus 2 years up to a maximum of 5 years
11. Variation(s) to September start	N/A
12. Modes of study	FT
13. Modes of delivery	On-campus, standard;
14. Intermediate awards, titles and FHEQ Level of Award	Postgraduate Certificate in Aerospace Engineering - FHEQ Level 7 Postgraduate Diploma in Aerospace Engineering - FHEQ Level 7
15. UCAS Code	N/A
16. HECoS Code	100115
17. Route Code	H400PSAEROSP
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 2030 Brunel Placement Learning Policy, as published under the 'Placements' section of the ' Managing Higher Education Provision with Others ' page. Engineering Council, UK-SPEC document "Chartered Engineer and Incorporated Engineer Standard" SARTOR specification for matching sections

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)	The project topic in ME5563 and the dissertation project can be chosen by students subject to staff approval. The topic must be directly relevant to aerospace engineering. ME5544 will have the participation of invited lecturers from industry and/or universities in selected scientific areas related to advanced topics in Aerospace Engineering.
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

To provide engineering graduates with a theoretical and technical grounding in key aerospace disciplines while providing the professional and transferable skills to enable them to maximise their employability and career prospects.

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. Advanced theories in aerodynamics and the role and applicability of computational fluid dynamics in aerospace engineering.				ME5543 ME5539
	K	2. The principles and technology of propulsion in aerospace applications.				ME5543 ME5539
	K	3. Design and Analysis of aircraft structures, loads and aeroelasticity.				ME5562

	K	4. Fundamentals of the design and operation of a range of aerospace vehicles, including: satellites, rockets, helicopters and autonomous aerial vehicles.				ME5543 ME5539
	K	5. The principles, techniques and tools of fixed-wing aircraft design with reference to airframe structure, aerodynamics, propulsion, use of materials, and mission requirements.				ME5539 ME5543
	K	6. Fundamental aspects of spacecraft design and space flight mechanics.				ME5543
	K	7. Management and business practices and their limitations; legal and ethical responsibilities of engineering business.				ME5641
	K	8. A range of topics of special importance to the aerospace industry, concerning the environment, sustainability, risk and safety.				ME5544
	K	9. Research methodology in an engineering context from both theoretical and practical perspectives.				ME5571 ME5539 ME5563 ME5500
	K	10. The principles of the engineering design process as applied to a large multi-disciplinary engineering project.				ME5539 ME5563 ME5500
	C	11. Define and organise a substantial individual in-depth research investigation.				ME5539 ME5563 ME5500
	C	12. Be original and innovative in the application of knowledge in aerospace engineering to a major design project.				ME5539 ME5563 ME5500

C	13. Evaluate critically current research and technology in aerospace engineering and to evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses.				ME5539 ME5563 ME5500
C	14. Deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences.				ME5539 ME5563 ME5500
C	15. Demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level				ME5563 ME5500
C	16. Identify and apply appropriate methods — theoretical or empirical, analytical or computational — to specific problems in the field of aerospace.				ME5539 ME5563 ME5500
S	17. Exercise initiative, personal responsibility and teamwork.				ME5563
S	18. Perform confident decision-making in complex and unpredictable situations common to cross-disciplinary engineering projects.				ME5563 ME5500
S	19. Employ principles of good research practice and undertake a well-structured piece of independent investigation and original research.	x			ME5500

S	20. Communicate scientific ideas and findings effectively and appropriately through written reports and oral presentations to specialist and non-specialist audiences.				ME5539 ME5563 ME5539 ME5563 ME5500
S	21. Use specialist aircraft design software and search complex sources of data and information.				ME5539 ME5563 ME5500
S	22. Have an industrial perspective on the aerospace engineering profession.				ME5641
S	23. Perform the managerial and business functions expected of staff in first level management positions in engineering organisations.				ME5563
S	24. Conduct independent learning ability required for continuing professional development.				ME5539 ME5500

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

Knowledge-and-understanding learning outcomes

Acquisition of 1 to 7 through a combination of lectures, seminars, tutorials, coursework, assignments, directed reading and laboratory visits.

Acquisition of 8 through a combination of lectures (given by external lecturers), assignments, flight simulator demonstrations and appropriate visits: Air Accidents Investigation Branch (AAIB); test centres; and full-scale flight simulator facilities.

Acquisition of 9 through a combination of lectures, seminars, tutorials, coursework, assignments, directed reading and the dissertation project.

Acquisition of 10 through lectures, seminars, coursework and the group design project with weekly staff supervision.

The individual dissertation project and the group design project enable the student to apply and consolidate elements of the knowledge and understanding acquired in 1-10.

Throughout the period of study, students are encouraged to undertake additional reading to supplement and consolidate what is being taught/learned and to broaden their individual knowledge and understanding of the subject.

Cognitive skills

Skills 11-16 are developed concurrently in the course through a combination of lectures, seminars, tutorials, coursework, assignments, oral presentations, directed reading, group design and individual dissertation projects.

Other skills and attributes

Skills 17-24 are developed concurrently in the course through a combination of lectures, seminars, tutorials, coursework, assignments, computer laboratory classes, oral presentations, directed reading, group design and individual dissertation projects.

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, individual and group projects, 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

All of the skills are assessed using written coursework including technical project reports and through the dissertation.

Other skills and attributes

All of the skills are assessed using written coursework including technical project reports, dissertation and 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>ME5539 Design and analysis of Aerospace Vehicles (15 credits)</p> <p>ME5543 Advanced Aerodynamics, Propulsion Systems and Space Mechanics (15 credits)</p> <p>ME5544 Current Topics in Aerospace (15 credits)</p> <p>ME5571 Research methods and Sustainable Engineering (15 credits)</p> <p>ME5641 Strategy and Business Planning (15 credits)</p> <p>ME5562 Aircraft Structures, Loads and Aeroelasticity (15 credits)</p> <p>ME5563 Group Project in Aerospace Engineering (30 credits)</p> <p>ME5500 Dissertation (60 credits) Core: Block</p>	<p>Optional modular block codes, titles and credits</p>
<p>FHEQ Level 7 Progression and Award Requirements 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> <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>	