

# Programme Specification for Postgraduate Programme

## Leading to:

### MSc in Building Services Engineering with Sustainable Energy

Applicable for all postgraduate students starting in 2020

Version No.	Date	Notes – QA USE ONLY	AO
2020-21 v1	6 October 2020	Programme Specification updated for 2020/21 entrants. Senate approved that a PGDip may be awarded by substitution of the dissertation for up to 30 credits of modular/assessment blocks in the taught part of the programme, provided the learning outcomes have been met.	JP
2020-21 v2	5 January 2021	Clarification of delivery of blocks in terms 1 and 2 as well as for DL starters in 2020/21.	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	CIBSE, EI, IMechE
6. Final award(s) and FHEQ Level of Award	MSc Building Services Engineering with Sustainable Energy FHEQ Level 7
7. Programme title	MSc Building Services Engineering with Sustainable Energy
8. Programme type (Single honours/joint)	N/A
9. Normal length of programme (in months) for each mode of study	12 months full time, 36 months distance learning
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	January start (Distance Learning only)
12. Modes of study	Full time, Distance Learning
13. Modes of delivery	On-campus, standard; Distance Learning
14. Intermediate awards, titles and FHEQ Level of Award	Postgraduate Diploma in Building Services Engineering with Sustainable Energy FHEQ Level 7
15. UCAS Code	N/A
16. JACS / HECoS Code	H300 / 100147
17. Route Code	H300PSBLSSSEN

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> <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.  <a href="#">Engineering Council, UK-SPEC document "Chartered Engineer and Incorporated Engineer Standard"</a> SARTOR specification for matching sections
19. Admission Requirements	Details of <a href="#">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.	
22. Further information about the programme is available from:	Course <a href="#">webpage</a>

### 23. EDUCATIONAL AIMS OF THE PROGRAMME

To develop the student's knowledge, understanding and skills in the engineering disciplines that underlie the design and operation of building services.

To develop the student's understanding of the use of sustainable energy in buildings and the environmental impact implications.

To produce graduates with expertise in the techniques and equipment employed, and an understanding of the underlying physical, physiological and economic factors.

## 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:

<b>Level 7</b>	<b>Category</b> (K = knowledge and understanding, C = cognitive (thinking) skills, S = other skills and attributes)	<b>Learning Outcome</b>	<b>Masters Only</b>	<b>Associated Assessment Blocks Code(s)</b>	<b>Associated Study Blocks Code(s)</b>	<b>Associated Modular Blocks Code(s)</b>
	K	1. The theory and practice of the design of building services in buildings, and the organisation of this process.				ME5507 ME5508 ME5506 ME5509 ME5513 ME5521 ME5545
	K	2. The theoretical basis for the study of the internal environment and human comfort.				ME5507 ME5508 ME5509 ME5513 ME5545
	K	3. The demands of environmental legislation and codes of practise in the practice of energy management.				ME5506 ME5507 ME5521
	K	4. The principles of energy conversion and appropriate thermodynamic machines.				ME5506 ME5508 ME5513 ME5545
	K	5. The principles of renewable energy technology.				ME5521 ME5506 ME5507

	K	6. The heat and mass transfer processes in the heating and cooling of buildings.				ME5508 ME5506 ME5513 ME5545
	K	7. Electrical power distribution and utilisation in buildings.				ME5507 ME5506 ME5513
	K	8. The principles and practice of energy efficient ventilation which is promoted by current regulations for buildings.				ME5545 ME5506 ME5507 ME5513
	K	9. How diverse building engineering systems interact and how they can be integrated.				ME5513 ME5507 ME5506
	C	10. Evaluate the internal environment.				ME5507 ME5508 ME5509 ME5513 ME5545
	C	11. Evaluate the environmental impact of energy solutions.				ME5506 ME5513 ME5521
	C	12. Identify and analyse the design requirements for the built environment.				ME5507 ME5506 ME5509 ME5513 ME5545
	C	13. Analyse and evaluate the performance of building services plant.				ME5507 ME5508 ME5506 ME5513 ME5545
	C	14. Evaluate the environmental effects of design solutions.				ME5506 ME5507 ME5513 ME5521 ME5545
	C	15. Apply sustainability principles to the building services industry.				ME5506 ME5507 ME5513 ME5545

	C	16. Plan personal projects.	x			ME5513 ME5500
	C	17. Identify and apply codified data and specifications.	x			ME5500
	C	18. Assemble and critically analyse relevant primary and secondary data.	x			ME5500
	C	19. Select and use appropriate investigative techniques.	x			ME5513 ME5500
	C	20. Develop a thesis by following a coherent argument.	x			ME5500
	S	21. Design and select building services equipment and systems.	x			ME5513 ME5500
	S	22. Define and organise a substantial investigation.	x			ME5500
	S	23. Select and employ appropriate research methods	x			ME5500
	S	24. Organise technical information into a concise, coherent document.	x			ME5500
	S	25. Employ 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

Full-time mode:

All of the learning outcomes are taught through small group examples classes with lectures. In addition: laboratory experiments support learning outcome 4; learning outcomes 2 and 8 are acquired through periodic formative coursework; learning outcomes 1 and 9 are acquired through design project work including searching for and using equipment manufacturer's data.

Distance-learning mode:

Coursework and project work are used in the same way as for the full-time mode. In place of the lecture classes, self-study course material including self-assessment questions are used.

Cognitive skills

Full-time mode:

Skills 10-19 are taught in lectures, and acquired through a combination of small group discussion and: for skills 12, 13 and 17, group design projects and examples papers issued regularly by lecturers; for skills 13, 16 and 17, coursework assignments; and, for skill 10, through design appraisal project work. Skill 20 is acquired through the development of an individual dissertation.

Other skills and attributes

Full-time mode:

Skills 21, 24 and 25 are acquired through the undertaking and the presentation of coursework assignments. Many of the skills are acquired through the dissertation project. Namely, skills 23 and 24 through the literature search and review, skills 22-25 through the preparation of the dissertation.

Distance-learning mode:

The same methods are used in the distance-learning mode and the full-time mode.

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

Knowledge-and-understanding learning outcomes

Each of the outcomes is assessed using written assignments and, in the case of outcomes 4, 6 and 7, unseen written exams are also used.

Cognitive skills

The same methods are used in the distance-learning mode and the full-time mode.

Other skills and attributes

All of the skills are assessed using written coursework including technical project reports. Additionally, skills 22-25 are assessed through the dissertation and skill 21 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**

<b>Compulsory modular block codes, titles and credits</b>	<b>Optional modular block codes, titles and credits</b>
<p><u>Term 1</u>  ME5507 Electrical Services and Lighting Design  (15 credits)  ME5508 Building Heat Transfer and Air Conditioning  (15 credits)  ME5509 Acoustics. Fire, Lifts and Drainage  (15 credits)  ME5513 Building Services Design and Management  (30 credits) – taught long thin.</p> <p><u>Term 2</u>  ME5506 Energy Conversion Technologies  (15 credits)  ME5521 Renewable Energy Technologies  (15 credits)  ME5545: Energy Efficient Ventilation for Buildings  (15 credits)  ME5513 Building Services Design and Management  (30 credits) – taught long thin.</p> <p>ME5500 Dissertation  (60 credits)  Core: Block</p> <p><u>September start – Year 1 modules (DL only)</u></p> <p>ME5507 Electrical Services and Lighting Design (15 credits)  ME5508 Building Heat Transfer and Air Conditioning (15 credits)  ME5509 Acoustics, Fire, Lifts and Drainage (15 credits)  ME5545: Energy Efficient Ventilation for Buildings (15 credits)</p> <p><u>January Start – Year 1 modules (DL only)</u></p> <p>ME5507 Electrical Services and Lighting Design (15 credits)</p> <p>ME5506 Energy Conversion Technologies (15 credits)</p> <p>ME5509 Acoustics. Fire, Lifts and Drainage (15 credits)</p> <p>ME5545: Energy Efficient Ventilation for Buildings (15 credits)</p>	<p>None</p>

**FHEQ Level 7 Progression and Award Requirements**

[As per Senate Regulation 3](#)

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.

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.