

Programme Specification for Undergraduate Programme

Leading to:

BSc (Hons) Product Design Engineering

BSc (Hons) Product Design Engineering with Placement

Applicable for all undergraduate students starting at FHEQ Level 4 in 2021

Version No.	Date	Notes – QA USE ONLY	QA
2021-22 v1	30 July 2021	Minor modification to programme. Blocks DM3803 and DM3701 added to one programme level learning outcome.	JP

Undergraduate 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/Brunel Design School/Design
4. Contributing college/department/division /associated institution	None
5. Programme accredited by	Institution of Engineering Designers
6. Final award(s) and FHEQ Level of Award	BSc (Hons) Product Design Engineering (FHEQ level 6)
7. Programme title	BSc Product Design Engineering with Placement
8. Programme type (Single honours/joint)	Single honours
9. Normal length of programme (in months) for each mode of study	36 months FT; 48 months thick sandwich mode
10. Maximum period of registration for each mode of study	Normal or standard duration plus 3 years (6 years FT; 7 years thick sandwich mode)
11. Variation(s) to September start	None
12. Modes of study	Standard
13. Modes of delivery	Full-time; thick sandwich
14. Intermediate awards, titles and FHEQ Level of Award	CertHE Product Design Engineering (FHEQ level 4) DipHE Product Design Engineering (FHEQ level 5) DipHE in Product Design Engineering with Placement (FHEQ level 5) BA (Ord) Product Design Engineering (FHEQ level 6) BA (Ord) Product Design Engineering with Placement (FHEQ level 6)
15. UCAS Code	WH27/WHF7
16. HECoS Code	100182
17. Route Code	H700USPRDES BPC route code: See Foundation in Design
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 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 entry requirements are provided on the University's and College website. Levels of English for non-native speakers are outlined on the language requirements pages.
20. Other relevant information (e.g. study abroad, additional information on placements)	Students will normally be expected to successfully complete at least 44 weeks industrial placement between FHEQ Levels 4 and 5. The placement will be subject to the approval of the Subject Area of Design and can be split between several institutions. At the discretion of the responsible Officer, a period of shorter duration than 44 weeks may be acceptable. Part of the placement can be an academic exchange at an overseas university, subject to approval of the Exchange Tutor in Design.
21. Programme regulations not specified in Senate Regulation 2. Any departure from regulations specified in Senate Regulation 2 must be stated here and approved by Senate.	None
22. Further information about the programme is available from the College website	BSc (Hons) Product Design Engineering

23. EDUCATIONAL AIMS OF THE PROGRAMME

The Product Design Engineering course aims to provide undergraduate students with a sound knowledge and broad understanding of the technological, manufacturing and creative aspects of design; principally focused on industrially-manufactured products. It aims to develop versatile design thinkers with significant engineering understanding who form the bridge between design and product engineering/manufacture. Typically, final year design projects would be expected to demonstrate the engineering and technical skills gained throughout the course.

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:

FHEQ Level	Category (K = knowledge and understanding, C = cognitive (thinking) skills, S = other skills and attributes)	Learning Outcome	Associated Assessment Blocks Code(s)	Associated Study Blocks Code(s)	Associated Modular Blocks Code(s)
4					
	K	The fundamental principles of engineering in the context of the design of products			DM1309 DM1601
		Placing visual thinking into the design process			DM1315 DM1611
		The concepts, principles and theories of the core sub-disciplines supporting the design process			DM1611 DM1315
		The concepts, principles and theories of the core sub disciplines supporting the design process;			DM1309 DM1601 DM1603 DM1611
	C	Demonstrate a broad understanding of 20 th and 21 st Century design issues;			DM1315
		The role of designers in society and the constraints within which their professional judgement will be exercised			DM1315
		Scrutinise and collate information from a variety of sources;			DM1315 DM1309 DM1601
	S (Practical Skills)	Use a wide range of tools and processes to prototype design solutions of mechanical and electronics systems			DM1309 DM1601
		Use sketching skills interactively to develop design ideas;			DM1315 DM1611
		Interface a computer to the control artefacts designed by the student.			DM1309 DM1601
	S (Transferable Skills)	Write technological reports in a recognised academic format;			DM1603 DM1309 DM1601

5				
K	The role of designers in society and the constraints within which their professional judgement will be exercised;			DM2316
	The professional and ethical responsibilities of a design practitioner;			DM2316
	Business operation and working practice within the Design Industry ('with Placement' awards)		DM2554	DM2555
C	Develop design solutions to meet specific performance requirements;			DM2319 DM2305 DM2604
	Evaluate design communication strategies			DM2604 DM2603 DM2316
	Scrutinise and collate information from a variety of sources;			DM2316 DM2319 DM2604
	Evaluate the feasibility of potential design solutions;			DM2316 DM2319 DM2305 DM2604
	Produce reflective communication(s) describing professional development experiences ('with Placement' awards);			DM2555
S (Practical skills)	Construct virtual modelling to simulate the form, function, performance and communication of design solutions;			DM2316 DM2604 DM2603
	Apply visual media in the presentation of design ideas;			DM2603 DM2316
	Prepare design portfolios;			DM2316
	Make product presentations using electronic media.			DM2316 DM2604 DM2603
S (Transferable Skills)	Plan, manage and execute both time and resources for project development;			DM2555
	Contribute effectively as a member of a team;			DM2316 DM2604
	Learn independently in familiar and unfamiliar situations;			DM2555 DM2316
	Learn effectively for the purpose of continuing professional development and in a wider context ('with Placement' awards)			DM2555

6				
K	The concepts, principals and theories relevant to the student's chosen area of design specialisation;	DM3803 DM3801	DM3701	DM3601 DM3316 DM3607
C	Use creative approach to solve design problems or improve existing designs;	DM3803	DM3701	DM3606
	Evidence understanding of environmental and energy issues that inform modern designers.	DM3803	DM3701	DM3316
	A thorough understanding of computer-based design methods applied to design challenges	DM3803	DM3701	DM3601
	Balance potentially conflicting requirements to resolve a single design solution.	DM3803	DM3701	DM3606
S (Practical Skills)	Produce a virtual or physical embodiment to fully validate a design proposal based on a precisely defined design brief for defined people who would benefit from the proposal.	DM3803	DM3701	DM3606
	Realise designs as functioning prototypes integrating appropriate technologies;	DM3803	DM3701	
S (Transferable Skills)	Communicate effectively with engineers, designers and non-technical specialists using a variety of appropriate techniques;	DM3801	DM3701	
	Plan, manage and execute both time and resources for project development;	DM3801	DM3701	

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

The modules students study at FHEQ levels 1 and 2 are focused on providing a sound academic foundation of subject knowledge. At level three students study subjects considered central to design, choose three further subjects from a pool of modules and undertake a Major Design Project.

Knowledge and understanding are acquired through a combination of lectures and other tutor-led activities such as group tutorials, laboratory sessions, computing sessions, manufacturing workshops, and guided independent study. At FHEQ Level 4, the programme provides students with an introduction to the knowledge required to develop design solutions. At FHEQ Level 5, the technological content is extended and the knowledge is applied to a range of mechanical and electronic systems. Also, at this level, an understanding of the design development process is acquired through a range of modules structured to promote graphical, creative and communication skills. At FHEQ Level 5, the design project offers students a first opportunity to demonstrate mastery of the technical, creative and personal skills acquired during the programme. At FHEQ Level 6, the options develop and extend knowledge and understanding of management practices in new product development and develop knowledge of the professional and ethical responsibilities of engineering designers. The FHEQ Level 6 major project allows students to conduct an individual research and development project of their choice. It is intended to provide students with an opportunity to demonstrate the integration of their technical abilities and creative skills together with abilities in project planning, management and communication. Also at FHEQ Level 6, students can select further modules to extend their knowledge in other areas of the design discipline.

Cognitive skills are developed concurrently with knowledge and understanding, through the teaching and learning programme outlined above. As students progress through the latter half of the programme they are given greater freedom to direct their own study areas within a guided framework. They are also encouraged to take their knowledge from the different subject domains and apply it in a holistic approach to problem solving.

The practical, professional and transferable skills are developed throughout the programme. Workshop-based skills are taught by experienced teaching technicians in a workshop environment providing the hands-on practise required. Other practical skills such as graphics, computing, and computing analysis skills are also taught with a high level of hands-on experience, in the majority of cases using industry-standard software. At every level the students are encouraged to learn through discussion with tutors and their peers. Presentation skills are developed through practical assignments and more informal tutorial sessions. Written skills are mainly developed through feedback from written assignments. Time-management is learned through the experience of meeting pre-notified coursework deadlines.

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

Knowledge and understanding are tested by means of a range of assessment tasks including, written and viva voce examinations, laboratory reports, written coursework, individual and group design projects, problem solving exercises, structured assignments, oral presentations, and visual media projects.

The range of assessment methods listed above will form the basis for assessment throughout the programme. Students will be expected to discuss or demonstrate their approaches and methods used to solve design problems, as well as their final solutions. In written activities students will be expected to have researched and critically analysed material gathered, appropriate to the level.

Where practical skills are taught on the programme these will be assessed by coursework requiring the application of that skill, e.g. workshop skills are tested by the production of various artefacts in wood, metal and plastic. Computing skills will be assessed by generation of suitable programs or models depending on the software used. Reports and oral presentations in various modules assess written and oral communication skills. Self-organised learning is encouraged at all levels of the programme and increases as students' progress, but is mainly demonstrated through the undertaking and completion of the major project. Group projects are used in various modules to allow students to demonstrate their ability to work in teams. The ability of students to manage time and resources is demonstrated by requesting the submission of work by specified firm deadlines, with late work being penalised in the mark awarded.

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 D- 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 D- or better, but not necessarily all elements, then the block itself is core, e.g. AB3000 Project (40)Core: Block

Where only some elements of assessments are required to be passed at D- 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 D- or better, but must be better than a grade F, in order to progress and to be eligible for the final award.

Foundation Level

The Foundation Level structure available to international students is specified in document "Validated Programme Element Specification for BPC Foundation Year in Design". These documents also specify the admission and progression requirements.

FHEQ Level 4	
Compulsory assessment block codes, titles and credit None	Optional assessment block codes, titles and credits None
Compulsory study block codes, titles and credit volume None	Optional Study block codes, titles and credit volume None
Compulsory modular block codes, titles and credits DM1309 Mechanics for Design (20) DM1315 Design Process 1 (40) Core: Block DM1601 Electronics and Mathematics (20) Core: All DM1603 Materials with Manufacturing (20) DM1611 Graphic Communication 1 (20)	Optional modular block codes, titles and credits None
FHEQ Level 4 Progression and Award Requirements As per Senate Regulation 2.	
FHEQ Level 5	
Compulsory assessment block codes, titles and credits None	Optional assessment block codes, titles and credits None
Compulsory study block codes, titles and credit volume None	Optional Study block codes, titles and credit volume None
Compulsory modular block codes, titles and credits DM2305 Electronics, Programming & Interfacing (20) DM2316 Design Process 2 (40) Core: Block DM2319 Dynamics, Mechanisms & Stress Analysis (20) DM2604 Design for Manufacture (20) DM2603 Design Communication (20)	Optional modular block codes, titles and credits None
FHEQ Level 4 Progression and Award Requirements As per Senate Regulation 2.	
FHEQ Level 5 – Sandwich Placement	
Compulsory assessment block codes, titles and credits	Optional assessment block codes, titles and credits
Compulsory study block codes, titles and credit volume DM2554 Pre-placement module (zero credits)	Optional study block codes, titles and credit volume
Compulsory modular block codes, titles and credits This modular block is only a requirement for the with Placement awards. DM2555 Professional Practice Industrial Experience (120) Core: Block	Optional modular block codes, titles and credits
FHEQ Level 5 Placement Progression and Award Requirements As per Senate Regulation 2. For BSc (Hons) Product Design Engineering with Placement, DM2555 will contribute 25% of the FHEQ Level 5 profile and 8.3% of the overall degree calculation	

FHEQ Level 6	
Compulsory assessment block codes, titles and credits DM3803 Product Design Engineering Major Project Core: Block (40) DM3801 Design & Innovation, Management & Process (20)	Optional assessment block codes, titles and credits None
Compulsory study block codes, titles and credit volume DM3701 Major Project (60)	Optional study block codes, titles and credit volume None
Compulsory modular block codes, titles and credits DM3601 Computer-based Design Methods (20)	Optional modular block codes, titles and credits Two options selected from: DM3606 Advanced Design Innovation (20) DM3316 Environmentally Sensitive Design (20) DM3330 Embedded Systems for Design (20) DM3607 Interaction and User Experience Design (20)
FHEQ Level 6 Progression and Award Requirements As per Senate Regulation 2. For BSc (Hons) Product Design Engineering with Placement, DM2555 will contribute 8.3% of the overall degree classification.	

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.