London South Bank University
EST 1892

Course Specification

A. Course Information			
Final award title(s)	BSc (Hons) Engineering Product Design		
Intermediate exit award title(s)	Dip HE in Engineering Product Design Cert HE in Engineering Product Design		
UCAS Code	**H770**	**Course Code(s)**	FT 5661 Foundation 5923
	London South Bank University		
School	☐ ASC ☐ ACI ☐ BEA ☐ BUS ☒ ENG ☐ HSC ☐ LSS		
Division	Mechanical Engineering and Design		
Course Director	Ben Clarke		
Delivery site(s) for course(s)	☒ Southwark ☐ Havering ☐ Other: please specify		
Mode(s) of delivery	☒Full time ☐Part time ☐other please specify		
Length of course/start and finish dates	(see table below)		

Mode	**Length years**	**Start - month**	**Finish - month**
Full time	3	September	August
Full time with Foundation year	4	September	August
Full time with placement/ sandwich year	4	September	August
Part time	N/A		
Part time with Placement/ sandwich year	N/A		

Is this course generally suitable for students on a student sponsored visa?	Yes	
Approval dates:	Course(s) validated /	November 2019
	Course Review date	November 2024
	Course specification last updated and signed off	August 2022
Professional, Statutory & Regulatory Body accreditation	The course is accredited by the Institution of Engineering Designers (IED) on behalf of the Engineering Council for the purposes of fully meeting the academic requirements for Incorporated Engineer (IEng) and partially meeting the academic requirement for registration as a Chartered Engineer (CEng) for five years from	

	intake year 2022. Also, the course is accredited by the Institution of Engineering Designers for the purposes of fully meeting the academic requirements for Registered Product Designer (RProdDes) and partially meeting the requirements for Chartered Technological Product Designer (CTPD) for five years from intake year 2020. PSRB accreditation will apply to Levels 4-6 only and not Foundation Year.	
Reference points:	Internal	Corporate Strategy 2020-2025 Academic Quality and Enhancement Website School Strategy LSBU Academic Regulations
	External	• QAA Quality Code for Higher Education 2018 • Framework for Higher Education Qualifications • QAA Subject Benchmark Statement for Art and Design • QAA Subject Benchmark Statement for Engineering • UK Standard for Professional Engineering Competence: Chartered Engineer and Incorporated Engineer Standard • SEEC Level Descriptors 2021

B. Course Aims and Features

Distinctive features of course	The **Foundation Year** is distinctive in the way students are prepared with the specific knowledge and skills required to progress onto the BEng programme at LSBU. The foundation year is designed to respond to the differing needs of students, particularly those from local areas in accordance with the policies and practice of equal opportunities. The content is designed to help students to develop academic, study and practical skills needed at foundation level, including a combination of core engineering modules associated with the provision of study and laboratory skills, mathematics, engineering science and scientific principles and with the specialist engineering subject enabling students to progress to BSc and BEng courses offered by the Division of Mechanical Engineering and Design. Our **Engineering Product Design** graduates blend creative thinking with scientific analysis and insight to make workable and functional product solutions. Graduates will be able to identify consumer needs and design products that meets technical, functional, aesthetic and economic criteria. Academic modules cover the complete design cycle from conceptual design through to engineering science, analysis and optimisation, product development, prototyping, presentation and design for manufacture. The final year of the course revolves around the delivery of a major design project: students are required to design, develop, prototype and manufacture a product to their own specifications. They will need to choose the appropriate manufacturing techniques and materials to make and test a working prototype of their product using our state-of-the-art IT and workshop facilities. The result will be showcased at the University's annual design show.
Course Aims	The aims of the **Foundation Year** are:

	• To provide students with the academic and pastoral support to enable them to achieve the foundation content and progress to the BEng. • To deliver a content that include study and laboratory skills in an engineering environment offering the best possible opportunity for students to develop their practical, intellectual and personal skills. • To fosters students' enthusiasm for their specialist subject, enabling them to develop intellectual, personal, practical and transferable skills as a sound basis for progression into work or further study. • To give students an adequate level of scientific and numerical literacy, so that they can thus approach the more advanced content offered by the BEng course. • To integrate practical and theoretical aspects of the subject disciplines offered. • To develop students' practical scientific skills whilst promoting safe laboratory practices, enabling them to become confident technically proficient and responsible scientists. • To promote student appreciation of the need to work with accuracy, precision and reproducibility, with due regard for the need for accurate and verifiable records. • To enable students to continue to develop their range of skills and understanding of modern analytical methods, beyond this course. **BSc (Hons) Engineering Product Design** There is a fundamental need for appropriate, good quality design if a product is to be successful, and to perform according to its specification, and so there is a continued demand for capable Engineering Product Designers who can produce desirable and functional products. This requirement exists for both consumer products and capital products markets, where designers are employed directly or through consultancies. This course is thus intended for individuals who aspire to become Engineering Product Designers and helps them to develop the appropriate skills, knowledge and competencies required to meet industry's needs and challenges. The general educational aims of this course are to develop students' intellectual and creative abilities, enabling them to enlarge their view of the study programme in a broad context beyond the limits of the subject and departmental perspectives. Critical self-awareness and confidence to make judgements will also be developed throughout the course. The course aims specifically to produce Engineering Product Designers who will be educated to Honours degree level and who are thus able to work at a professional level in industry. To this end graduates will be equipped with an understanding of engineering, design, materials, product functions and manufacturing; together with highly developed creative abilities and communication skills. In addition graduates will be able to make decisions, respond to market demand and successfully manage design activities. Graduates will also be prepared to become self-employed Engineering Product Designers or to undertake suitable post-graduate study at Masters or Doctorate level.

	The design of durable consumer products, and all associated issues, form the core of the course. This includes the study of the design process, technology, materials and manufacturing processes, aesthetics, ergonomics, inclusive design and sustainability (environmental, social and economic concerns). As well as a traditional approach to drawing and problem-solving processes, students have access to a wide variety of computer courses and systems. They are additionally encouraged to make full use of the extensive engineering and model-making workshops and are expected to develop working prototypes as well as appearance models. The ethos of the course is the preparation of individuals for employment in the technical design profession through a well-rounded course programme and educational experience. As well as developing theoretical and practical knowledge about the design discipline, students develop transferable skills. This enables them to become flexible and adaptable and able to adopt new and contemporary practices and technologies as and when necessary. Because Engineering Product Design is seen as a synthesis of art and engineering, the course includes study of both design and technology. In general, learning is experiential i.e. 'by doing'. This is supported by more formal lectures, seminars and tutorials. Discussion and debate are important parts of the course and help to develop students' ability to analyse, criticise and assess their own and others' work as part of the design process. As well as facilitating the development of technical expertise and general design knowledge, students' aesthetic sensibilities are refined throughout the course, which also develops their individuality through practice and the recognition of conceptual and practical boundaries. Graduates from this course will have the following knowledge, skills, abilities and characteristics: 1. Commitment and ability to follow a career in Engineering Product Design, allowing progression to Incorporated Engineer professional status. 2. Awareness of best current practice within industry, and future trends. 3. Industry-critical skills, including working effectively as part of a team and/or providing leadership for the team. 4. Effective communications skills, enabling the exchange of ideas with specialist professionals and with the public at large. 5. Continual Professional Development (CPD) skills, including critical self-awareness, reflection, independent judgement, responsibility for decisions, original thinking, managing own learning, and making use of scholarly reviews and primary sources. 6. Systematic and broad knowledge of key topics within Engineering Design together with the skills needed to update, extend and deepen, in further study and future career development. 7. Understanding of a cognitive map of topics within the Design subject area, incorporating design methods, creativity, materials, aesthetics, modelling and visualisation, model making and prototyping, ergonomics, and sustainability. 8. Understanding of a cognitive map of topics within the Engineering subject area incorporating well developed skills in Mechanics of Solids and Manufacturing and Materials, and familiarity with other core Engineering topics, like Dynamics and Thermofluids. All of this is underpinned by understanding of relevant science and engineering

	topics such as Mathematics, Electrical and Electronic Engineering, Computing and Control Systems. 9. Ability to analyse Mechanical Engineering components and systems from first principles, through to advanced simulation techniques; combined with an understanding of the advantages and disadvantages of different analysis approaches, and be able to select an appropriate method. 10. Competent practical skills including drawing and sketching, prototyping and model making, manufacturing techniques, 2D graphical communications and 2D and 3D digital (CAD) modelling. 11. Awareness of advanced manufacturing techniques, to inform design choices and to design products for cost-effective manufacture. 12. Ability to set up projects and manage them, approach design problems with creativity, and see all tasks to successful completion underpinned by an understanding of innovation and enterprise.
Course Learning Outcomes	**Foundation Year** A. Students will have knowledge and understanding of: A1. subject knowledge underpinning the major disciplines in engineering. A2. experimental methods and the development and testing of hypotheses. A3. methods used in the analysis, evaluation and critical review of evidence in engineering. A4. processes and procedures in sampling, data analysis and expressing precision, accuracy, and reproducibility. B. Students will develop their intellectual skills such that they are able to: B1. understand the role of rational argument. B2. appreciate the key features of a problem and suggest possible means of investigation. B3. be aware of the significance of hypotheses, experimental data and rational arguments. B4. apply a theory, concept, or subject-specific principle to a new context. C. Students will acquire and develop practical skills such that they are able to: C1. demonstrate safe practices and advise on safety procedures associated with a particular technique or methodology. C2. evaluate alternative methodologies for an investigation or completing a process. C3. organise and allocate duties, set targets, and evaluate progress in achieving a specific technical goal. C4. present data in a seminar or lecture C5. demonstrate competence in a range of basic statistical procedures C6. demonstrate competence in the use of word-processors, spreadsheets, and data presentation packages. D. Students will acquire and develop transferrable skills such that they are able to: D1. manage and adapt their work schedule and learning strategy. D2. adopt skills and techniques to address a particular problem.

	D3. be aware of the full range of sources of information, citing references properly. D4. appreciate the need and begin to communicate ideas, arguments and concepts in a rational and systematic way, using a variety of media; D5. assume responsibility for their own learning and work independently. D6. manage and monitor their role within a group working to meet specific targets. **BSc (Hons) Engineering Product Design** A. Graduates must be able to demonstrate their knowledge, and they must have an appreciation of the wider multidisciplinary engineering context and its underlying principles. They must appreciate the social, environmental, ethical, economic and commercial considerations affecting the exercise of their engineering judgement. **Students will have knowledge and understanding of:** *Underpinning Science and Mathematics* **A1 –** the scientific principles underpinning relevant technologies, to enable the modelling of routine engineering systems, processes and products, and collect and interpret data and draw conclusions in the solution of practical engineering design problems. *(US1i)* **A2 –** the mathematics necessary to support the application of key engineering design principles. *(US2i)* **A3 –** non-engineering disciplines in engineering design. *(US3i)* **A4 –** the functionality of common ICT tools and appropriate computer-based engineering design tools to solve problems. *(US4i)* *Design* **A5 –** business, customer and user needs, including considerations such as the wider engineering context, public perception, aesthetics and ergonomics, and how these are synthesised in a Product Design Specification (PDS). *(D2i)* *Economic, Legal, Social, Ethical and Environmental Contexts* **A6 –** the commercial, economic and social context of engineering processes. *(S1)* **A7 –** management techniques that may be used to achieve engineering design objectives including finance, law, marketing, personnel and quality. *(S2)* **A8 –** the requirement of engineering activities to promote sustainable development. *(S3i)* **A9 –** relevant legal requirements governing engineering activities, including personnel, health and safety, contracts, intellectual property rights, product safety and liability issues. *(S4)* **A10 –** risk issues, including health and safety, environmental and commercial risk. *Engineering Practice* **A11 –** contexts in which engineering design knowledge can be applied to solve engineering problems. *(P3i)* **A12 –** standard engineering workshop and laboratory practice. *(P2i)* **A13 –** specific engineering design codes of practice and industry standards, with some knowledge of design factors and requirements for safe operation. *(P6i)* **A14 –** quality issues in engineering design. *(P7i)*

	B. Graduates must be able to demonstrate creative and innovative ability in the synthesis of solutions and in formulating designs. They must be able to apply appropriate quantitative science and engineering tools to the analysis of problems. They must be able to comprehend the broad picture and thus work with an appropriate level of detail. **Students will develop their intellectual skills such that they are able to:** *Engineering Analysis* **B1 –** monitor, interpret and apply the results of analysis and modelling in order to bring about continuous improvement. *(E1i)* **B2 -** use the results of analysis to solve engineering design problems, apply technology and implement engineering processes. *(E2i)* **B3 –** apply quantitative methods and computer software relevant to engineering design technology, within a multidisciplinary approach. *(E3i)* **B4 –** apply a systems approach to engineering design problems through knowledge of the application of relevant technologies. *(E4i)* *Design* **B5 –** define engineering problems, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards. *(D1i)* **B6 –** work with information that may be incomplete or uncertain, and be aware that this may affect the engineering design. **B7 –** apply problem-solving skills, technical knowledge and understanding to create or adapt engineering design solutions that are fit for purpose, including operation and maintenance. *(D4i, D5i)* **B8 -** manage the engineering design process, including cost drivers, and present report containing analysis, evaluation and discussion of the results/outcomes. **B9 -** use engineering design processes, methodologies and tools to adapt engineering design to meet new purposes or applications. *(D6i)* **B10 –** generate ideas to solve problems and design new products, systems, components or processes, synthesising from those already in existence. *Engineering Practice* **B11 –** use and apply information from a range of technical literature. *(P4i)* C. Graduates must possess practical design and engineering skills acquired through, for example, work carried out in laboratories and workshops; in industry through supervised work experience; in individual and group project work; and in the development and use of computer software in design, analysis and control. Evidence of group working and of participation in a major project is expected. **Students will acquire and develop practical skills such that they are able to:** *Design* **C1 –** communicate their work to technical and non-technical audiences using visualisations such as physical prototypes or models; renderings of a product, system, component or process. *Engineering Practice*

	C2 – understand and use relevant materials, equipment, tools, processes and products *(P1i)* **C3 –** work with intellectual property rights (IPR) including patent search and principles of copyright and design registration. *(P5i)* D. Graduates must have developed transferable skills that will be of value in a wide range of situations. These include problem solving, communication and working with others, as well as the effective use of general IT facilities and information retrieval skills. They also include planning self-learning and improving performance, as the foundations for lifelong learning / CPD. In addition, the following advanced outcomes should be expected of IEng Degree graduates: • the ability to develop, monitor and update a plan, to reflect a changing operating environment; • the ability to monitor and adjust a personal programme of work on an ongoing basis, and to learn independently; • the ability to exercise initiative and personal responsibility, which may be as a team member or leader, and; • the ability to learn new theories, concepts, methods etc and apply these in unfamiliar situations. **Students will acquire and develop transferrable skills such that they are able to:** *Economic, Legal, Social, Ethical and Environmental Contexts* **D1 –** understand the need for, and application of, a high level of professional conduct and ethical responsibility, including a knowledge of professional codes of conduct, and the global and social context of engineering design. *Engineering Practice* **D2 –** work with technical uncertainty, limited or contradictory information, being able to make value judgments in the solution of engineering design problems (*(P10i)* **D3 –** understand the principles of managing engineering design projects, and be able to work in a team *(P8i)* *General Skills* **D4 –** apply their skills in problems solving, communication; information retrieval; working with others; writing, structuring and presenting technical reports and specifications; and the effective use of general IT facilities. **D5 –** plan self-learning and improve performance, as the foundation for lifelong learning / CPD. **D6 –** plan and carry out a personal programme of work. **D7 –** exercise personal responsibility, which may be as a team member.

C. Teaching and Learning Strategy

Foundation Year

Laboratory skills and technical proficiency in analytical methods (A2, A3 and A4) are initiated in the first semester, specifically in the modules Study & Laboratory Skills and Scientific Principles for Engineering, they are then further developed (often involving more subject-specific techniques) in the second semester specialist stream module. These key modules concentrate on practical exercises that students must complete to demonstrate competence.

Diagnostic tests in Study & Laboratory Skills, undertaken within the first few weeks after the star of semester one as part of the module "Study and Laboratory Skills", allow an assessment of student ability in Mathematics and English, and this module also begins the student's induction into the scientific method (A2 and A3). A schedule of personal tutoring monitors student progress especially during the first year and is informed by student progress on the Study & Laboratory Skills module, beginning with the outcomes of the initial diagnostic tests.

All modules employ a variety of teaching and learning methods that encourage students to consider and challenge the evidence with which they are presented. Very often, the assessment schedule encourages students to question some key concept or principle. This may be formally assessed or simply be part of group discussions, debates or as part of some problem-solving exercises. Problem-solving exercises typically require students to work individually or collectively by applying their understanding of current thinking or methodologies to a new context (B2, B4).

The second semester coursework is seen as an important part of assessment to measure the student's ability to integrate their developed scientific and numerical literacy skills with a properly devised methodology to enable them to investigate a subject area closely linked to their intended field of undergraduate study (B3, B4). The student will develop their coursework topic in consultation with the module leader (B2, B3) and are likely to have to address methodological problems to bring the project to completion (B2).

Safe practice in laboratories begins with the first semester module Study & Laboratory Skills and is further reinforced through the stream specialist module in semester two (C1, C3). These modules develop confidence in the laboratory and relate experimental activities to scientific understanding.
In all modules there are some methodological components and techniques, even if there is no practical element associated with the teaching and learning, coursework exercises are used in some modules to assess student understanding of these techniques, often as part of a tutorial or group-work session.
A key emphasis of the integrated foundation year is the development of the student's practical and analytical skills through both subject-specific and generic practical.
Students are inducted into teamwork skills in the Study & Laboratory Skills module and part of their assessment of this module is to produce a reflective account of their experiences in the laboratory (C1). Students are encouraged to consider alternative ways to approach specific problems, or to address specific questions (C1, C2, C3), typically through their practical work. This way student are able to build their confidence in their technical and practical skills and reinforce the basic concepts delivered in the associated lecture programme. The stream specialist module integrates many of the previous learned skills, and also requires the students to analyse and present their data in a standard scientific manner. Student must organise their schedule of work in consultation with the module leader and bring their project to conclusion with a properly presented report (C3-C6).
The required skills are fully mapped through the curriculum, and each is met by the combination of modules undertaken. A number of tasks assessed in both the Study & Laboratory Skills and Scientific Principles for Engineering modules measure their progress in managing their own learning (D1, D5) and to work effectively as part of a team (D6). These all require a flexible approach to data acquisition, interpretation and presentation, not least because of the range of topics being covered (D1). Presentations and seminars are used extensively in semester 2. The second semester project work again is seen as serving an important test of many of these skills (D1-D5).

All students are allocated a personal tutor on initial enrolment to the course. The personal tutor is the point of contact for all matters relating to the student's welfare and progress whilst at London South Bank. The personal tutors are supported by the course director. All tutees will meet their course team at the start and throughout the course.

The primary teaching contact with students, in classrooms, laboratories and workshop, is supported by online resources available on the VLE Moodle for each module.
For their general understanding of the course, students can access a course guide and a summary of the syllabus; these are updated annually and available online.

For each module, the module leader provides a module guide. Students have access to books in the Perry library, based on the information of core and optional resources recommended in the reading list available for each module.

The VLE will contain information for core and additional learning experiences.

BSc (Hons) Engineering Product Design

Teaching and learning takes place through design studio practice, lectures, seminars, group and individual tutorials. Student learning is experiential, through design and other project work in the design teaching rooms, workshops and computing laboratories. Students enhance their critical, analytical and visual and oral communication skills through group discussions, group critiques and written assignments.

Knowledge and Understanding
Knowledge and understanding in mathematics and engineering is taught through two level four modules and two level five modules. Teaching is combined with the university's Mechanical Engineering degree for two modules at level 5. This ensures an appropriate level of rigour in engineering analysis. Final year modules include project-based teaching in CFD and FEA. The second year module Machine Drives and Mechatronics covers electronics and control theory.

The common design modules at levels 4 and 5, Design Methods, Design thinking and Applications, and Design Contexts and Communications introduce students to a wide range of non-engineering disciplines through the design issues addressed in project briefs. The final Engineering Product Design Project, which requiring analytical content to underpin the design work, also requires students to synthesis a coherent product that is appropriate to a specific application, often involving research and knowledge of other disciplines. CAD is taught throughout level 4, and visual communications teaching is embedded throughout the course, in particular as the Visual Communications module at level 4.

Intellectual Skills
The teaching of intellectual skills of engineering and maths is intertwined with the teaching of knowledge and understanding. Modules include the development and use of mathematical models for components and systems for analysis and synthesis, performance evaluation, and understanding practical operation. Standard analytical methods for representation and analysis of systems and components are also studied, for example, Finite Element Analysis, and Computational Fluid Dynamics. Students use industry standard software at Levels 4, 5, and 6 to produce designs and to evaluate scenarios (Level 4) and subsequently for quantitative analysis of performance in the CAD 2 (Level 5) module and the Level 6 Portfolio Engineering Projects module. The 60 credit Level 6 Engineering Product Design Project modules require acquisition of quantitative analysis and software skills to complete and demonstrate understanding of the work undertaken.

A central feature of the teaching on this course is through project-based design briefs. As students progress through L5 (eg Design Thinking and Applications) and L6 (eg Portfolio Engineering Projects) these become more open-ended, requiring students to conduct further investigation to define the problem and demonstrate an awareness of the effects of any uncertainties.

Practical Skills
Students use design projects as a vehicle to cover design methodology, physical prototyping, workshop skills, and an introduction to materials and manufacturing technology. Computer-based workshops include practical investigations, design exercises and CAD simulations to develop more advanced skills.

Transferable skills
The course is largely centred around design project-based coursework, in which a broad range of transferrable skills – in particular relating to teamwork, leadership, project management and communication - are required. The L5 module Design Contexts and Communications prepares students for work placements and introduces issues of ethical responsibility, professional codes of conduct, and the global context of their industry. This understanding is developed at L6 through the Innovation and Enterprise module.

Subject-related and Generic Resources:
These include the Perry Library, the metalwork and woodwork workshops, the rapid prototyping laboratories, the thermodynamics laboratory, the solid mechanics laboratory, the advanced vehicle engine test laboratory, and computer labs.

The core and optional reading lists are supplied at the end of each module guide produced by the module leader. A copy of the module guide will be made available on the Virtual Learning Environment, VLE (Moodle) and the reading lists can also be accessed through LSBU's Library website.

Overview of learning support:
To support students in their learning, academic and support staff are available during the normal operating hours of the University via prior appointment. Academic staff also operate surgery hours where no prior appointments are needed. The University buildings and library are open from 8am to 9pm during term time, while the library operates for an extended period during examinations. Some specialist workshops/computing spaces etc. are not accessible outside the normal operating hours of 9am to 5pm, unless timetabled for use in a module. Teaching sessions for PT students may run until 9pm at the latest and the relevant and required areas are open for access as timetabled.

The LSBU Skills for Learning Centre offers students a range of interactive workshops, one-to-one tutorials and drop-in sessions delivered by experienced learning developers. It also offers Language support for international students. Students who struggle to understand some of the basics, or feel they need additional support in understanding fundamentals of mathematics, are advised to use the drop-in sessions where they can provide comprehensive advice and guidance.

Teaching Staff:
Most modules are delivered by full-time academic staff from within the parent division where the course resides and or sometimes by staff from other areas within the School of Engineering or University where expertise lies. The primary aim is that each module is taught by a single member of staff, which most likely is the module leader (support teaching may be needed depending on the nature/size of the module etc. where students are sub grouped into multiple tutorials or laboratory sessions). Occasionally, PG students or part-time teaching or research staff may support certain sessions, and, in such cases, the relevant tutors are trained, and care is taken to ensure the quality of the provision.

Virtual Learning Environment (VLE):
Each course has a course site on the VLE, where relevant information is posted by the respective Course Director. Each module on the course has a Module site on the VLE and all relevant teaching and learning material such as module guides, lecture notes, teaching slides, tutorial and seminar sheets, workshop exercises, past exam papers, assignments, supplement material etc. are made available by the module leader. The virtual learning environment (Moodle) can be accessed using the Windows OS login credentials and can be accessed from any Internet connected PC inside or outside of the LSBU campus.

D. Assessment

Foundation Year

Students experience variety of assessments during their foundation year, including the initial review of their proficiency in maths and English as they commence the Study & Laboratory Skills module. Knowledge is tested by unseen in-class assessments and open book written examination in the Scientific Principles unit (A1) in the first semester.

Other modules assess using essays or problem-solving exercises. Great emphasis is placed on a series of subject specific practical experiences that have to be completed satisfactorily to pass the Study & Laboratory Skills module and in this way we are able to check student competencies in basic practical skills.

In the second semester the variety of assessment styles is continued, assessment is a combination of examination, a variety of coursework, including presentations (A3), essays, problem-solving exercises (A4) intended to aim development and preparation for undergraduate study.

BSc (Hons) Engineering Product Design

Assessment Overview:

The university keeps an assessment and examinations procedure; a current version can be accessed at http://www.lsbu.ac.uk/__data/assets/pdf_file/0010/84349/assessment-and-examination-procedure.pdf

Coursework in modules can be either formative or summative and the details are usually made available in the module guide and explained to students by the module leader at the beginning of the semester. The module guide will also provide details about the weightage of these assessment components and when the relevant brief will be made available, including submission instructions and deadlines.

Formative assessment and feedback is part of the learning process on the course that provides constructive feedback to the learner. This allows students to improve their quality of work. It does not contribute towards a final module grade. All modules will provide students opportunities to receive formative assessment and feedback. Formative assessment typically includes discussions in the classroom, during tutorial exercises, simulation exercises, workshop or computing exercises, questions and answer sessions, peer discussions, observations, reflection on learning, presentation rehearsals.

Each module is summatively assessed by the process that is deemed most appropriate to the subject matter. In many engineering subjects, this may mean that there is a combination of coursework and examination, whilst in design and business-based modules assessment is by 100% coursework. When and where appropriate, assessment is undertaken as group presentations and critiques. During and after critiques, students benefit from oral and written feedback. As and when appropriate, assignments are submitted to the Faculty Office or digitally through the VLE and are assessed by academic staff who provide written feedback and tutorial advice.

Knowledge and understanding is assessed formatively through tutorials and practice tests, and summatively through exams in Engineering Mathematics (IEng), Introduction to Mechanical and Electronic Engineering, Solid Mechanics and FEA, and Machine Drives and Mechatronics. This knowledge and understanding is also assessed indirectly across the project-based modules, where students are expected to incorporate engineering understanding into their project solutions.

Similarly, engineering analysis skills, and the application of the knowledge base, are assessed formatively in tutorials and practice tests, and summatively through exams as above. Modules at levels 5 and 6 see progressively more design based and systems analysis questions in examinations, and through coursework projects in project-based modules. Level 6 modules in Portfolio Engineering Projects, and Engineering Product Design Project offer the best chance for students to demonstrate their ability to apply a systems approach to solving engineering problems. At levels 5 and 6, students have to analyse systems in laboratory workshops and assignments as part of their summative assessment (for example in Machine Drives and Mechatronics).

Design is generally assessed through submission of coursework, the nature of which is dependent on the particular brief. This includes design sketch work and development portfolios or log books, mockups, ergonomic rigs, proof-of-principle prototypes, aesthetic (physical) models, CAD models and renderings, digital simulations, 2D presentation graphics, video or animations, and oral presentations either individually or in groups. Some more technical elements such as product specifications, project management etc are assessed through written reports.

Typically each design project is assessed through a rubric grading structure, with a checklist of marking criteria, against each of which a grade is assigned for each student. Due to the occasionally subjective or non-quantifiable nature of design, summative work is marked by at least two assessors, from which a final grade is averaged.

Students are encouraged to make design assumptions in order to demonstrate their understanding of the importance of requirements specification. They are required to submit a PDS document as a component of the Design and Manufacture Project (L5) and the Engineering Product Design Project (L6), and to justify the claims made within the document.

Communication within engineering and design (B8, C1, D4) is also assessed via engineering reports and presentations in addition to development portfolios, prototypes etc. Some modules specifically employ practical simulation exercises as a major part of the assessment.

Students ability to put their work into its economic, legal, social, ethical and environmental context are assessed through project-based coursework assignments. For example, in Design Contexts and Communications (L5), students conduct a life cycle assessment exercise on a commercial packaging design, and propose design improvements based on the results. At Level 6, consideration of sustainability issues are explicit in the project marking criteria. Evidence is presented through project log books and development portfolios, and summarized in a project report.

Engineering practice is assessed in situ throughout the course, by observation of laboratory and workshop practice, and submission of standard logbooks and reports based on student activity. The skills of engineering practice are formally assessed at Level 4 though simple ‘design and make’ exercises. Further development of these skills is indirectly assessed through design assignments in specialist modules at Levels 5 and 6. Additionally these are assessed in the Level 6 individual and group projects, both of which include assessment by presentation and viva-voce examinations. A risk assessment is submitted as an assessed component of the Engineering Product Design Project.

The Engineering Product Design Project at Level 6 is assessed by a variety of means, including the public display of work in the annual degree show.

E. Academic Regulations

The University’s Academic Regulations apply for this course.

School specific protocols apply, including compliance with professional, statutory and regulatory bodies’ requirements.

F. Entry Requirements

Foundation Year:

Entry requirements

- A Level DD or;
- BTEC National Diploma MPP or;
- Access to HE qualifications with Pass or;
- Equivalent level 3 qualifications worth 64 UCAS points
- Applicants must hold 5 GCSEs A-C including Maths and English or equivalent (reformed GCSEs grade 4 or above).
- We welcome qualifications from around the world.
- English language qualifications for international students: IELTS score of 6.0 or Cambridge Proficiency or Advanced Grade C.

BSc (Hons) Engineering Product Design

In order to be considered for entry to the course applicants are currently required (for 2018 entry) to have the following qualifications:

- A Level BBB (must include Maths), **or**;
- BTEC National Diploma DDM **or**;
- Access to HE qualifications with 24 Distinctions and 21 Merits (must include a minimum of 3 Merits in Design Technology, Maths and Physics) **or;**
- Entry level 3 qualifications worth 122 UCAS points (must include Maths or Physics)

Applicants must hold 5 GCSEs A-C (including Maths and English) or equivalent.

The University welcomes applications from all those interested in furthering their education. If applicants do not meet the standard entry requirements but can demonstrate that life / work skills would make them suitable for undergraduate study, then they may be considered.

English language qualifications for international students: IELTS score of 6.0 or Cambridge Proficiency Advanced Grade C.

Applicants are normally interviewed before being offered a place and are asked to bring along a portfolio of work. There is no such thing as a 'standard' portfolio. In short, we would like to see exciting example sheets of design or other creative work, which collectively illustrate a breadth of skills. This might include (in no particular order):

- Problem-solving
- 2D sketch work
- Creative thinking (mind maps, spider diagrams)
- Colour treatments
- Photography
- 3D collages
- 3D sculpture
- 2D and 3D prototyping/model making
- CAD or other digital work
- Presentation drawings/boards

Accredited Prior Experiential Learning

APEL may be taken into account in determining the entry requirements for candidates with relevant work experience, but cannot replace the requirement for formal qualifications in Mathematics.

Direct Entry

Applicants may be considered for entry to the second year of the course. Applicants will be interviewed and will be required to have formal qualifications at level 4, to demonstrate preparedness for direct entry.

G. Course structure

Course overview

- The academic year is organised into two semesters, each requiring roughly 15 weeks (12 teaching weeks, 1 revision week and 2 exam weeks) of attendance by students.

Foundation Year -Full time

All modules are compulsory. No optional modules.

	Semester 1		**Semester 2**	
Level S	Applied Mathematics 1	20 credits	Mathematics for Engineering	20 credits
	Scientific Principles for Engineering	20 credits	Engineering Science	20 credits
	Study & Laboratory Skills	20 credits	Engineering Design and Modelling	20 credits

BSc (Hons) Engineering Product Design

The BSc (Hons) Engineering Product Design course consists of a single pathway that comprises the following mandatory modules:

	Semester 1		Semester 2	
Level 4	Design Methods			40 Credits
	Visual Communications			20 Credits
	CAD 1			20 Credits
	Introduction to Mechanical and Electronic Engineering			20 Credits
	Mathematics (IEng Stream)			20 Credits
Level 5	Design Thinking and Applications	20 Credits	Design and Manufacture Project	20 Credits
	Solid Mechanics and FEA	20 Credits	Machine Drives and Mechatronics	20 Credits
	Design Contexts and Communications			20 Credits
	CAD 2			20 Credits
Placement	Industrial Placement (currently optional but strongly recommended)			
Level 6	Research Methods for Design Projects	20 Credits	Engineering Product Design project	60 Credits
	Portfolio Engineering Projects	20 Credits		
	Innovation and Enterprise	20 Credits		

Placements

Students are strongly encouraged to undertake a sandwich work placement between Levels 5 and 6. This placement must last for an equivalent of at least 30 weeks in total and be within the design and/or manufacturing industry.

We work within LSBU's Student Placement procedure guidelines and practices.

An optional Industrial placement (or sandwich year) is available to all students following successful completion of Level 5. An Industrial Placement does not contribute to the final degree award.

Students undertaking an Industry Placement will be enrolled onto a Placement Module and will be requested to submit evidence of their placement at the end of the year; including a daily logbook. Students on an Industrial Placement will be visited once per semester, if possible, by a member of the teaching team, or by their Personal Tutor.

The university has a centralised Employability Service that works alongside the Schools to deliver a placement offer to students. This year they have created a dedicated Placement team that deliver pre and post placement workshops to students alongside supporting them secure a placement and all compliance.

Procedure and check for suitability:
Requiring students to complete a 'placement confirmation form'.
Returning the form to the placements inbox: ss-placements@lsbu.ac.uk at least two weeks prior to the start of the placement.
The placement officer will contact the placement provider for confirmation and to carry out any due diligence / health and safety checks / check for suitability.
Students cannot begin the placement until they have received an approval email for the placement officer.

Support mechanisms: Documentation and Placement Tutors
Support documents will be supplied to
i. Students (placement handbook):
ii. Staff / placement tutors (placement organisers handbook):
iii. Placement providers (placement provider handbook):

Students in MED will be assigned a placement tutor; a member of the academic team who will be their point of contact during the placement. Students will be notified before and during the placement that they can contact their placement tutor as often as they wish for advice and mentorship during their placement.

Support Mechanisms: Visits
Within the course team, it is the responsibility of each placement tutor to make contact with their respective student(s) and their placement provider regularly while the student is on placement. This can take the form of a visit, email or phone call. In line with LSBU placement procedures, it is the student's responsibility to liaise with their supervisor at their placement so that they are available to meet or speak to their placement tutor at LSBU for 15 to 40 minutes to discuss their progress. There will be a minimum requirement of one meeting or conversation per semester.

H. Course Modules

Foundation Year

Module Code	Module Title	Level	Semester	Credit value	Assessment	
					CW %	EX %
CEE_S_AM1	Applied Mathematics 1	S	1	20	100	
CEE_S_SPE	Scientific Principles for Engineering	S	1	20	50	50
CEE_S_SLS	Study & Laboratory Skills	S	1	20	100	
CEE_S_MFE	Mathematics for Engineering	S	2	20	100	
CEE_S_ESC	Engineering Science	S	2	20	100	
MED_S_EDM	Engineering Design and Modelling	S	2	20	100	

BSc (Hons) Engineering Product Design

Module Code	Module Title	Level	Semester	Credit value	Assessment
MED_4_MAT	Mathematics	4	1+2	20	100% Exam
MED_4_IME	Introduction to Mechanical and Electrical Engineering	4	1+2	20	100% Coursework
MED_4_DME	Design Methods	4	1+2	40	100% Coursework
MED_4_VCO	Visual Communications	4	1+2	20	100% Coursework
MED_4_CA1	CAD 1	4	1+2	20	100% Coursework
MED_5_SMF	Solid Mechanics and FEA	5	1	20	70% Exam, 30% Coursework
MED_5_MDM	Machine Drives and Mechatronics	5	2	20	70% Exam, 30% Coursework
MED_5_DTA	Design Thinking and Applications	5	1	20	100% Coursework
MED_5_DCC	Design Contexts and Communications	5	1+2	20	100% Coursework
MED_5_CA2	CAD 2	5	1+2	20	100% Coursework
MED_5_DMP	Design and Manufacture Project	5	2	20	100% Coursework
MED_6_IAE	Innovation and Enterprise	6	1	20	100% Coursework
MED_6_PEP	Portfolio Engineering Projects	6	1	20	100% Coursework

MED_6_RMD	Research Methods for Design Projects	6	1	20	100% Coursework
MED_6_EPD	Engineering Product Design Project	6	1+2	60	100% Coursework

I. Timetable information

Foundation Year

Timetabled classes fall in three or four days per week.

BSc (Hons) Engineering Product Design

Students are timetabled to be in classes for four days a week, plus one day of self-directed study.

Many classes may be taught in blocks, so that for a period of one or more weeks, students are mainly focussed on one specific project.

Students should expect around 18 contact hours per week at level 4 (year 1), and around 12 contact hours per week at levels 5 and 6 (years 2 and 3/4).

J. Costs and financial support

Course related costs

- **books or other learning materials:** Circa £30-50 per annum *(all required texts are available from the university library, but many students find it useful to own a copy of some core material).*
- **specialist equipment:** Circa £100 per annum *(for example, sketching equipment and usb storage devices/ external hard drives)*
- **field trips:** Circa £30 per annum *(usually travel cost for London based field trips)*

Tuition fees/financial support/accommodation and living costs

- Information on tuition fees/financial support can be found by clicking on the following link - http://www.lsbu.ac.uk/courses/undergraduate/fees-and-funding
- Information on living costs and accommodation can be found by clicking the following link- https://www.lsbu.ac.uk/student-life/our-campuses/southwark/cost-of-living-in-london

List of Appendices

Appendix A: Curriculum Map

This map provides a design aid to help course teams identify where course outcomes are being developed, taught and assessed within the course. It also provides a checklist for quality assurance purposes and may be used in validation, accreditation and external examining processes. Making the learning outcomes explicit will also help students to monitor their own learning and development as the course progresses.

Foundation Year

Modules			**Course outcomes**																			
Level	**Title**	**Code**	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**
S	Scientific Principles for Engineering	CEE_S_SPE	DTA		DTA		D		DT	DT	DT	D				DT	D	D	D		D	
S	Study and Laboratory Skills	CEE_S_SLS		DTA	DTA	DTA	DT	D	DTA		DTA	DT	DTA	DTA	DTA	DTA	DTA	DTA	DTA	DTA	DTA	DTA
S	Applied Mathematics 1	CEE_S_AM1	DTA			D		DT									D	D			DT	
S	Mathematics for Engineering	CEE_S_MFE	DTA			DT		DT							DTA		D				DT	
S	Engineering Science	CEE_S_ESC	DTA			DT	D	DTA		DT		D				DT	D					
S	Engineering Design and Modelling	MED_S_EDM	DTA	DTA		DTA	DTA	DTA		DTA		DTA	DTA				DTA	DTA	D	DTA	DTA	D

BSc (Hons) Engineering Product Design
Curriculum Map for IEng requirements

Module		IMEE	Maths	DM	Vis Comms	CAD 1	SMFEA	MD&M	DTA	DCC	DMP	CAD 2	PEP	I&E	RMDP	Project
Module code		MED_4_IME	MED_4_MAT	MED_4_DME	MED_4_VCO	MED_4_CA1	MED_5_SMF	MED_5_MDM	MED_5_DTA	MED_5_DCC	MED_5_DMP	MED_5_CA2	MED_6_PEP	MED_6_IAE	MED_6_RMD	MED_6_EPD
IEng Science and Mathematics																
US1i	Knowledge and understanding of the scientific principles underpinning relevant current technologies, and their evolution	**X**	X				**X**	**X**			X	X	X		X	X
US2i	Knowledge and understanding of mathematics and an awareness of statistical methods necessary to support application of key engineering principles	X	**X**				X	X					X			X
Engineering Analysis																
E1i	Ability to monitor, interpret and apply the results of analysis and modelling in order to bring about continuous improvement	X					X						**X**		X	X
E2i	Ability to apply quantitative methods in order to understand the performance of systems and components	X					X	**X**	X				X			X
E3i	Ability to use the results of engineering analysis to solve engineering problems and to recommend appropriate action	X	X				X	X				X	**X**			X
E4i	Ability to apply an integrated or systems approach to engineering problems through know-how of the relevant technologies and their application.	X				X	X	**X**				X	X			X
Design																
D1i	Be aware of business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics				X				X		X		X	X		X
D2i	Define the problem, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards			X			X		X	X	X		X	X	X	X
D3i	Work with information that may be incomplete or uncertain and be aware that this may affect the design						X		X	X			X	X	X	X
D4i	Apply problem-solving skills, technical knowledge and understanding to create or adapt design solutions that are fit for purpose including operation, maintenance, reliability etc	X		X	X	X	X	X	X	X	X	X	X	X		X
D5i	Manage the design process, including cost drivers, and evaluate outcomes	X									X		X			X
D6i	Communicate their work to technical and non-technical audiences			X	X	X	X			X	X	X	X	X		X

		Module	IMEE	Maths	DM	Vis Comms	CAD 1	SMFEA	MD&M	DTA	DCC	DMP	CAD 2	PEP	I&E	RMDP	Project
		Module code	MED_4_IME	MED_4_MAT	MED_4_DME	MED_4_VCO	MED_4_CA1	MED_5_SMF	MED_5_MDM	MED_5_DTA	MED_5_DCC	MED_5_DMP	MED_5_CA2	MED_6_PEP	MED_6_IAE	MED_6_RMD	MED_6_EPD
IEng																	
Economic, legal, social, ethical and environmental context																	
S1i	Understanding of the need for a high level of professional and ethical conduct in engineering and a knowledge of professional codes of conduct									X		X		X	X		X
S2i	Knowledge and understanding of the commercial, economic and social context of engineering processes									X					X	X	X
S3i	Knowledge of management techniques that may be used to achieve engineering objectives											X		X	X	X	X
S4i	Understanding of the requirement for engineering activities to promote sustainable development		X		X						X				X		X
S5i	Awareness of relevant legal requirements governing engineering activities, including personnel, health and safety, contracts, intellectual property rights, product safety and liability issues.									X					X	X	X
S6i	Awareness of risk issues, including health and safety, environmental and commercial risk.											X		X	X	X	X
Engineering practice																	
P1i	Knowledge of contexts in which engineering knowledge can be applied (eg operations and management, application and development of technology, etc)		X		X			X			X		X	X		X	X
P2i	Understanding of and ability to use relevant materials, equipment, tools, processes, or products		X		X	X	X	X		X		X	X	X			X
P3i	Knowledge and understanding of workshop and laboratory practice		X		X				X					X			X
P4i	Ability to use and apply information from technical literature		X					X				X		X		X	X
P5i	Ability to use appropriate codes of practice and industry standards											X		X		X	X
P6i	Awareness of quality issues and their application to continuous improvement		X				X						X	X		X	X
P7i	Awareness of team roles and the ability to work as a member of an engineering team		X					X	X	X				X	X		
General skills																	
GS1i	Apply their skills in problem solving, communication, working with others, information retrieval, and the effective use of general IT facilities		X	X	X	X	X	X	X	X	X		X	X	X	X	X
GS2i	Plan self-learning and improve performance, as the foundation for lifelong learning/CPD										X					X	X
GS3i	Plan and carry out a personal programme of work		X													X	X
GS4i	Exercise personal responsibility, which may be as a team member.				X			X	X	X				X	X		X

Curriculum Map for RProdDes requirements

Module	IMEE	Maths	DM	Vis Comms	CAD 1	SMFEA	MD&M	DTA	DCC	DMP	CAD 2	PEP	I&E	RMDP	Project
Module code	MED_4_IME	MED_4_MAT	MED_4_DME	MED_4_VCO	MED_4_CA1	MED_5_SMF	MED_5_MDM	MED_5_DTA	MED_5_DCC	MED_5_DMP	MED_5_CA2	MED_6_PEP	MED_6_IAE	MED_6_RMD	MED_6_EPD
RProdDes															
Design															
D1p Ability to evaluate design solutions against relevant constraints and criteria	X		X		X	X	X	X		X	X	X	X	X	X
D2p Ability to address human needs through the use of research, anthropometric data and ergonomic principles and provide design solutions according to customer and user requirements. Ability to generate a product design specification (PDS) by defining requirements as separate criteria including other factors such technical aspects and legislative demands.			X					X		X		X		X	X
D3p Ability to recognise product design cost drivers for both recurring and non-recurring costs and to appreciate the cost implications of differing production volumes								X		X		X	X		X
D4p Ability to generate a wide range of design ideas, concepts and proposals independently and in teams in response to set or self generated design briefs	X		X			X		X		X		X		X	X
D5p Ability to select, test and exploit materials and manufacturing processes in the synthesis of product design solutions	X		X							X		X			X
D6p Ability to apply creative and logical thinking processes as well as design methodologies to the creation of design solutions	X		X			X	X	X	X	X		X		X	X
D7p Ability to select and use the appropriate manual drawing / construction / CAD, communication and technological media in the realisation of design ideas	X		X	X	X	X	X	X		X	X	X			X
D8p Ability to demonstrate visual literacy and drawing ability appropriate to the practice of product design	X		X	X						X	X	X			X
D9p Ability to develop concepts sufficiently to provide manufacturing instructions and specifications					X					X	X	X			X
D10p Ability to employ materials, media, techniques, methods, technologies and tools associated with product design through drawing, modelling and computer visualisation using skill and imagination	X		X	X	X	X	X	X	X	X	X	X		X	X
D11p Ability to integrate Industrial Design aspects including form, texture and colour				X				X		X	X				X
Economic, social and environmental context															
S1p Understanding that positive ethical and professional conduct underpins design practice.			X							X		X	X	X	X
S2p Knowledge and understanding of risk issues, including health and safety, environmental and commercial risk, and of risk assessment and risk management techniques.										X		X	X	X	X
S3p Awareness of legal requirements governing design activities, including personnel, health and safety, product liability and safety.										X		X	X	X	X
S4p Knowledge and understanding of the management of the design process.										X		X	X	X	X
S5p An awareness of financial, economic, social legislative and environmental factors of relevance to product design.								X	X				X	X	
S6p Awareness of the social and environmental impact and the application of sustainable design principles.									X	X			X		

Curriculum Map for RProdDes requirements

	Module	IMEE	Maths	DM	Vis Comms	CAD 1	SMFEA	MD&M	DTA	DCC	DMP	CAD 2	PEP	I&E	RMDP	Project
	Module code	MED_4_IME	MED_4_MAT	MED_4_DME	MED_4_VCO	MED_4_CA1	MED_5_SMF	MED_5_MDM	MED_5_DTA	MED_5_DCC	MED_5_DMP	MED_5_CA2	MED_6_PEP	MED_6_IAE	MED_6_RMD	MED_6_EPD
RProdDes																
Design practice																
P1p	Ability to create new processes or products through synthesis of ideas from a wide range of sources using a broad knowledge of material and material selection principles	X		X			X	X	X	X	X		X			X
P2p	Ability to practise collaborative and independent work to realise a range of practical, creative and theoretical projects	X		X			X	X	X		X		X	X		X
P3p	Ability to meet deadlines, liaise with industrial collaborators, make presentations, research and collate information, produce reports and evaluate the design and research work of self	X		X			X	X	X	X	X	X	X	X	X	X
P4p	Ability to analyse problems of a creative nature and to provide appropriate solutions	X		X					X		X		X		X	X
P5p	Understanding and application of intellectual property rights (IPR) including patent search and principles of copyright and design registration										X			X	X	X
P6p	Understanding of specific design codes of practice and industry standards, with some knowledge of design factors and requirements for safe operation	X				X					X	X			X	X
P7p	Awareness of management and quality assurance issues in product design										X			X	X	X
P8p	Working effectively as part of a group with respect for the dignity, rights and needs of others	X		X			X	X	X				X	X		X
P9p	To develop skills associated with professional practice; time management, project management, professional level communication, self promotion, interview techniques, information gathering and use of information and communication technology as appropriate	X		X	X	X	X	X	X	**X**	X		X	X	X	X
P10	Ability to evaluate technical risks and address risk in design methodology										X		X		X	X
P11	Ability to write a PDS, design reports and present design ideas in a rational and coherent manner				X						**X**	X			X	X
Underpinning science and mathematics																
US1	Ability to consider and apply the appropriate mathematical and engineering principles to a particular product design problem	**X**	X				**X**	X		X	X	X	**X**		X	X
Design analysis																
E1p	Ability to research, select, evaluate, manipulate and manage information relevant to the analysis and synthesis of product design solutions	X		X			X	X		X	X		X	X	X	X
E2p	Ability to apply analytical skills in relation to designed objects including the ability to undertake visual analysis and to analyse designed objects in relation to their context	X		X		X	X	X				X	X		X	X
E3p	Ability to apply a systematic approach to problem solving using appropriate design tools and techniques	X		X			X	X	X		X		X		X	X

Appendix B: Embedding the Educational Framework for Undergraduate Courses

The Educational Framework at London South Bank University is a set of principles for curriculum design and the wider student experience that articulate our commitment to the highest standards of academic knowledge and understanding applied to the challenges of the wider world.

The Educational Framework reflects our status as University of the Year for Graduate Employment awarded by *The Times and The Sunday Times Good University Guide 2018* and builds on our 125 year history as a civic university committed to fostering social mobility through employability and enterprise, enabling our students to translate academic achievement into career success.

There are four key characteristics of LSBU's distinctive approach to the undergraduate curriculum and student experience:

- Develop students' professional and vocational skills through application in industry-standard facilities
- Develop our students' graduate attributes, self-awareness and behaviours aligned to our EPIIC values
- Integrate opportunities for students to develop their confidence, skills and networks into the curriculum
- Foster close relationships with employers, industry, and Professional, Statutory and Regulatory Bodies that underpin our provision (including the opportunity for placements, internships and professional opportunities)

The dimensions of the Educational Framework for curriculum design are:

- **informed by employer and industry** needs as well as professional, statutory and regulatory body requirements
- **embedded learning development** for all students to scaffold their learning through the curriculum taking into account the specific writing and thinking requirements of the discipline/profession
- **high impact pedagogies** that enable the development of student professional and vocational learning through application in industry-standard or authentic workplace contexts
- **inclusive teaching, learning and assessment** that enables all students to access and engage the course
- **assessment *for* learning** that provides timely and formative feedback

All courses should be designed to support these five dimensions of the Educational Framework. Successful embedding of the Educational Framework requires a systematic approach to course design and delivery that conceptualises the student experience of the curriculum as a whole rather than at modular level and promotes the progressive development of understanding over the entire course. It also builds on a well-established evidence base across the sector for the pedagogic and assessment experiences that contribute to high quality learning.

This appendix to the course specification document enables course teams to evidence how their courses meet minimum expectations, at what level where appropriate, as the basis for embedding the Educational Framework in all undergraduate provision at LSBU.

Dimension of the Educational Framework	Minimum expectations and rationale	How this is achieved in the course
Curricula informed by employer and industry need	<u>Outcomes focus and professional/employer links</u> All LSBU courses will evidence the involvement of external stakeholders in the curriculum design process as well as plan for the participation of employers and/or alumni through guest lectures or Q&A sessions, employer panels, employer-generated case studies or other input of expertise into the delivery of the course provide students with access to current workplace examples and role models. Students should have access to employers and/or alumni in at least one module at level 4.	Students are introduced to external stakeholders and potential employers in modules at all levels (e.g. L4 Introduction to Mechanical and Electrical Engineering coursework; L5 Design and Manufacture Project; L6 Portfolio Engineering Projects all have an external brief and engagement with external stakeholders). We regularly invite visiting speakers. Field trips (e.g. to the Design Museum) also give students an external focus for their work.
Embedded learning development	<u>Support for transition and academic preparedness</u> At least two modules at level 4 should include embedded learning development in the curriculum to support student understanding of, and familiarity with, disciplinary ways of thinking and practising (e.g. analytical thinking, academic writing, critical reading, reflection). Where possible, learning development will be normally integrated into content modules rather than as standalone modules. Other level 4 modules should reference and reinforce the learning development to aid in the transfer of learning.	In L4 Design Methods, students are taught design thinking within the context of their transition to higher education. In L4 Introduction to Mechanical and Electrical Engineering, students are taught about the structure of engineering analyses. Other modules at L4 and beyond develop this support, and include support in e.g. critical reading and reflection.
High impact pedagogies	<u>Group-based learning experiences</u> The capacity to work effectively in teams enhances learning through working with peers and develops	Students work in groups regularly throughout the course, including in the L4 modules Design Methods and

	student outcomes, including communication, networking and respect for diversity of perspectives relevant to **professionalism** and **inclusivity**. At least one module at level 4 should include an opportunity for group working. Group-based learning can also be linked to assessment at level 4 if appropriate. Consideration should be given to how students are allocated to groups to foster experience of diverse perspectives and values.	Introduction to Mechanical and Electrical Engineering. Students are assessed on group work. We balance student-selected groups and randomly allocated groups to give a range of experiences.
Inclusive teaching, learning and assessment	<u>Accessible materials, resources and activities</u> All course materials and resources, including course guides, PowerPoint presentations, handouts and Moodle should be provided in an accessible format. For example, font type and size, layout and colour as well as captioning or transcripts for audio-visual materials. Consideration should also be given to accessibility and the availability of alternative formats for reading lists.	All course materials are provided in an accessible format, through the VLE and in hard copies.
Assessment *for* learning	<u>Assessment and feedback to support attainment, progression and retention</u> Assessment is recognised as a critical point for at risk students as well as integral to the learning of all students. Formative feedback is essential during transition into university. All first semester modules at level 4 should include a formative or low-stakes summative assessment (e.g. low weighted in final outcome for the module) to provide an early opportunity for students to check progress and receive prompt and useable feedback that can feed-forward into future learning and assessment. Assessment and feedback communicates high expectations and develops a commitment to **excellence**.	All L4 modules contain formative assessment.

High impact pedagogies	<u>Research and enquiry experiences</u> Opportunities for students to undertake small-scale independent enquiry enable students to understand how knowledge is generated and tested in the discipline as well as prepare them to engage in enquiry as a highly sought after outcome of university study. In preparation for an undergraduate dissertation at level 6, courses should provide opportunities for students to develop research skills at level 4 and 5 and should engage with open-ended problems with appropriate support. Research opportunities should build student autonomy and are likely to encourage **creativity** and problem-solving. Dissemination of student research outcomes, for example via posters, presentations and reports with peer review, should also be considered.	Students are given small and well-defined projects in L4 (for example in Design Methods). At L5 the project briefs are more open-ended, in preparation for the final project at L6. Posters, presentations and reports are all assessed during the course, and are subject to peer review and discussion.
Curricula informed by employer and industry need / Assessment *for* learning	<u>Authentic learning and assessment tasks</u> Live briefs, projects or equivalent authentic workplace learning experiences and/or assessments enable students, for example, to engage with external clients, develop their understanding through situated and experiential learning in real or simulated workplace contexts and deliver outputs to an agreed specification and deadline. Engagement with live briefs creates the opportunity for the development of student outcomes including **excellence**, **professionalism**, **integrity** and **creativity**. A live brief is likely to develop research and enquiry skills and can be linked to assessment if appropriate.	The design courses at LSBU use live briefs and projects at all levels.
Inclusive teaching, learning and assessment	<u>Course content and teaching methods acknowledge the diversity of the student cohort</u> An inclusive curriculum incorporates images, examples, case studies and	We are committed to this inclusivity.

	other resources from a broad range of cultural and social views reflecting diversity of the student cohort in terms of, for example, gender, ethnicity, sexuality, religious belief, socio-economic background etc. This commitment to **inclusivity** enables students to recognise themselves and their experiences in the curriculum as well as foster understanding of other viewpoints and identities.	
Curricula informed by employer and industry need	Work-based learning Opportunities for learning that is relevant to future employment or undertaken in a workplace setting are fundamental to developing student applied knowledge as well as developing work-relevant student outcomes such as networking, **professionalism** and **integrity**. Work-based learning can take the form of work experience, internships or placements as well as, for example, case studies, simulations and role-play in industry-standards settings as relevant to the course. Work-based learning can be linked to assessment if appropriate.	Students are encouraged to complete a sandwich placement in their third year: they then use this work-based learning to inform their final year projects.
Embedded learning development	Writing in the disciplines: Alternative formats The development of student awareness, understanding and mastery of the specific thinking and communication practices in the discipline is fundamental to applied subject knowledge. This involves explicitly defining the features of disciplinary thinking and practices, finding opportunities to scaffold student attempts to adopt these ways of thinking and practising and providing opportunities to receive formative feedback on this. A writing in the disciplines approach recognises that writing is not a discrete representation of knowledge but integral to the process of knowing and	Within their course, students are asked to communicate in the languages of engineering and design. To this end, they produce, and are assessed on, reports, posters, presentations, logbooks, physical models (both prototypes and production models), and short videos, as well as essays and exam answers. Scaffolding, including formative feedback, is provided to help students master each of these features of disciplinary communication.

	understanding in the discipline. It is expected that assessment utilises formats that are recognisable and applicable to those working in the profession. For example, project report, presentation, poster, lab or field report, journal or professional article, position paper, case report, handbook, exhibition guide.	
High impact pedagogies	<u>Multi-disciplinary, interdisciplinary or interprofessional group-based learning experiences</u> Building on experience of group working at level 4, at level 5 students should be provided with the opportunity to work and manage more complex tasks in groups that work across traditional disciplinary and professional boundaries and reflecting interprofessional work-place settings. Learning in multi- or interdisciplinary groups creates the opportunity for the development of student outcomes including **inclusivity**, communication and networking.	This is embedded within the course. Engineering Product Design students work with Product Design students at all levels, and so gain from interdisciplinarity. At level 6, EPD students also work with Mechanical Engineering students, including masters students.
Assessment *for* learning	<u>Variation of assessment</u> An inclusive approach to curriculum recognises diversity and seeks to create a learning environment that enables equal opportunities for learning for all students and does not give those with a particular prior qualification (e.g. A-level or BTEC) an advantage or disadvantage. An holistic assessment strategy should provide opportunities for all students to be able to demonstrate achievement of learning outcomes in different ways throughout the course. This may be by offering alternate assessment tasks at the same assessment point, for example either a written or oral assessment, or by offering a range of different assessment tasks across the curriculum.	Each module in the course is assessed in a variety of ways. This adds up to a range of assessment tasks across the curriculum.

Curricula informed by employer and industry need	<u>Career management skills</u> Courses should provide support for the development of career management skills that enable student to be familiar with and understand relevant industries or professions, be able to build on work-related learning opportunities, understand the role of self-appraisal and planning for lifelong learning in career development, develop resilience and manage the career building process. This should be designed to inform the development of **excellence** and **professionalism**.	This is built into our learning outcomes for the course: see above.
Curricula informed by employer and industry need / Assessment *for* learning / High impact pedagogies	<u>Capstone project/dissertation</u> The level 6 project or dissertation is a critical point for the integration and synthesis of knowledge and skills from across the course. It also provides an important transition into employment if the assessment is authentic, industry-facing or client-driven. It is recommended that this is a capstone experience, bringing together all learning across the course and creates the opportunity for the development of student outcomes including **professionalism**, **integrity** and **creativity**.	Our level 6 project is a capstone project for the course. The annual degree show highlights the importance of the L6 project, and allows students at earlier levels to understand the full possibilities of the course.

Appendix C: Personal Development Planning

Personal Development Planning (PDP) is a structured process by which an individual reflects upon their own learning, performance and/or achievement and identifies ways in which they might improve themselves academically and more broadly.

Approach to PDP	
1 Supporting the development and recognition of skills through the personal tutor system.	PDP is developed via individual tutorials / portfolio review sessions for Level 4 and 5 students at the end of every semester. This is intended to cater for students' pastoral care as well as their academic concerns, which may or may not relate to tutors' subject specialist areas. Skills shortfalls are identified by academic staff, and appropriate strategies implemented where necessary. At Level 6, each student is assigned two personal tutors for their final year project, with whom they are required to meet weekly. In addition to guiding the academic content of the project, this allows staff to direct the students on the PDP issues that arise from their Major Project.
2 Supporting the development and recognition of skills in academic modules/modules.	The nature of the subject and the appropriate teaching methodologies require that students continually develop their own plans for learning throughout the course, from the beginning of the first year to the end of the final year. Most Design teaching is tutorial based so PDP occurs throughout the course by default; students also present and discuss their design project work at the end of each assignment. Most modules are designed to develop student skills and professional attitudes: Student output is considered to be of a professional, industry-based, practical standard, as evidenced by the course's accreditation from the Institution of Engineering Designers. One of the hallmarks of London South Bank courses is the way that students carry out practical assignments in an industrial setting and this course develops this in a hands-on manner. In order to progress on the course it is necessary to demonstrate that students are developing professionalism and management skills, and that PDP is addressed. Each module is intended to assist in inculcating habits of working and ways of thinking which lead to the development of professionalism.
3 Supporting the development and recognition of skills	In addition to general PDP students engage in specific PDP activities. Students learn about aspects of PDP from a variety of individuals during specific careers

through purpose designed modules/modules.	tutorials, seminars and workshops (with alumni, practicing designers, placement students and members of the LSBU employability team) which take place mostly in the **Design Contexts and Communications** module (Level 5). Students attend guest lectures as part of and in addition to modules; these sessions are both subject related and related to professional practice.
4 Supporting the development and recognition of skills through research projects and dissertations work.	The **Design Contexts and Communications** module (Level 5) introduces research habits with the production of a referenced contextual report. This includes learning how to research, using research material, time planning, personal organisation and project management. There is also a significant research requirement in the early stages of, and to some extent throughout, the Major Design Project, taught in the **Research Methods for Design Projects** module.
5 Supporting the development and recognition of career management skills.	The **Design Contexts and Communications** module (Level 5) lays specific emphasis on careers management skills, with student, exercises in identification of potential employment opportunities, developing professional portfolios, and writing targeted covering letters and CVs. Students develop enterprise and entrepreneurial skills through the Level 6 module in **Innovation and Enterprise**, in such a way that they have a solid foundation to underpin a successful career as an entrepreneur or in carrying out further collaborative enterprise projects.
6 Supporting the development and recognition of career management skills through work placements or work experience.	All students are encouraged to undertake and are supported throughout a year-long sandwich placement. On return to LSBU they present an overview of their experience to current students and produce A3 sheets for their portfolios. Practical hands-on experience developed through taking the **Engineering Product Design Project**. This is designed to provide overall design and project management skills that are of a recognised industry and business standard. The Design Degree Show and New Designers exhibitions are also part of PDP – the students stage the public events (with support from academic staff) and liaise with visitors, many of whom are potential employers.
7 Supporting the development of skills by recognising that they can be	Students are encouraged to develop their professional standard through membership of appropriate bodies at the correct professional level. This may include professional bodies, venture capital

developed through extra curricula activities.	groups, other enterprise, technology transfer groups, research organisation, local business groupings, etc. Students are encouraged to participate in recruitment by presenting their work to prospective applicants at open days, and may make presentations to other groups as appropriate. Many of them also work as student ambassadors for the University. Evidence suggests that the students find this sort of extracurricular activity rewarding.
8 Supporting the development of the skills and attitudes as a basis for continuing professional development.	The teaching of the Design courses, combined with an open access policy in the engineering workshops, is intended to foster a strong “studio culture” amongst the student body, which is highly beneficial to the quality of the work produced and the professional attitudes of the students.
9 Other approaches to personal development planning.	Skills audit and group skills evaluation are recognised and developed through most of the modules that students undertake, particularly at Levels 5 and 6.
10 The means by which self-reflection, evaluation and planned development is supported e.g. electronic or paper-based learning log or diary.	Students maintain both a physical and a digital portfolio throughout their degrees, and this is reviewed with staff members at the end of each semester.

Appendix D: Terminology

awarding body	a UK higher education provider (typically a university) with the power to award higher education qualifications such as degrees
bursary	a financial award made to students to support their studies; sometimes used interchangeably with 'scholarship'
collaborative provision	a formal arrangement between a degree-awarding body and a partner organisation, allowing for the latter to provide higher education on behalf of the former
compulsory module	a module that students are required to take
contact hours	the time allocated to direct contact between a student and a member of staff through, for example, timetabled lectures, seminars and tutorials
coursework	student work that contributes towards the final result but is not assessed by written examination
current students	students enrolled on a course who have not yet completed their studies or been awarded their qualification
delivery organisation	an organisation that delivers learning opportunities on behalf of a degree-awarding body
distance-learning course	a course of study that does not involve face-to-face contact between students and tutors
extracurricular	activities undertaken by students outside their studies
feedback (on assessment)	advice to students following their completion of a piece of assessed or examined work
formative assessment	a type of assessment designed to help students learn more effectively, to progress in their studies and to prepare for summative assessment; formative assessment does not contribute to the final mark, grade or class of degree awarded to students

higher education provider	organisations that deliver higher education
independent learning	learning that occurs outside the classroom that might include preparation for scheduled sessions, follow-up work, wider reading or practice, completion of assessment tasks, or revision
intensity of study	the time taken to complete a part-time course compared to the equivalent full-time version: for example, half-time study would equate to 0.5 intensity of study
lecture	a presentation or talk on a particular topic; in general lectures involve larger groups of students than seminars and tutorials
learning zone	a flexible student space that supports independent and social earning
material information	information students need to make an informed decision, such as about what and where to study
mode of study	different ways of studying, such as full-time, part-time, e-learning or work-based learning
modular course	a course delivered using modules
module	a self-contained, formally structured unit of study, with a coherent and explicit set of learning outcomes and assessment criteria; some providers use the word 'course' or 'course unit' to refer to individual modules
national teaching fellowship	a national award for individuals who have made an outstanding impact on student learning and the teaching profession
navigability (of websites)	the ease with which users can obtain the information they require from a website
optional module	a module or course unit that students choose to take
performance (examinations)	a type of examination used in performance-based subjects such as drama and music
professional body	an organisation that oversees the activities of a particular profession and represents the interests of its members
prospective student	those applying or considering applying for any programme, at any level and employing any mode of study, with a higher education provider

regulated course	a course that is regulated by a regulatory body
regulatory body	an organisation recognised by government as being responsible for the regulation or approval of a particular range of issues and activities
scholarship	a type of bursary that recognises academic achievement and potential, and which is sometimes used interchangeably with 'bursary'
semester	either of the parts of an academic year that is divided into two for purposes of teaching and assessment (in contrast to division into terms)
seminar	seminars generally involve smaller numbers than lectures and enable students to engage in discussion of a particular topic and/or to explore it in more detail than might be covered in a lecture
summative assessment	formal assessment of students' work, contributing to the final result
term	any of the parts of an academic year that is divided into three or more for purposes of teaching and assessment (in contrast to division into semesters)
total study time	the total time required to study a module, unit or course, including all class contact, independent learning, revision and assessment
tutorial	one-to-one or small group supervision, feedback or detailed discussion on a particular topic or project
work/study placement	a planned period of experience outside the institution (for example, in a workplace or at another higher education institution) to help students develop particular skills, knowledge or understanding as part of their course
workload	see 'total study time'
written examination	a question or set of questions relating to a particular area of study to which candidates write answers usually (but not always) under timed conditions