



Course Specification

A. Course Information			
Final award title(s)	BEng (Hons) Computer Engineering		
Intermediate exit award title(s)	DipHE in Computer Engineering CertHE in Engineering		
UCAS Code (BEng)	GH63	Course Code(s)	Full time 4630 Part time 4631
	London South Bank University		
School	<input type="checkbox"/> ASC <input type="checkbox"/> ACI <input type="checkbox"/> BEA <input type="checkbox"/> BUS <input checked="" type="checkbox"/> ENG <input type="checkbox"/> HSC <input type="checkbox"/> LSS		
Division	Electrical and Electronic Engineering		
Course Director	Stavros Dimitriou		
Delivery site(s) for course(s)	<input checked="" type="checkbox"/> Southwark <input type="checkbox"/> Havering <input type="checkbox"/> Other: please specify		
Mode(s) of delivery	<input checked="" type="checkbox"/> Full time <input checked="" type="checkbox"/> Part time <input checked="" type="checkbox"/> other please specify-SANDWICH		
Length of course/start and finish dates	Mode	Length years	Start - month
	Full time	3	September
	Full time with placement/ sandwich year	4	September
	Part time	4	September
	Part time with Placement/ sandwich year	Not Offered	
Is this course generally suitable for students on a Tier 4 visa?	Please complete the International Office questionnaire Yes Students are advised that the structure/nature of the course is suitable for those on a Tier 4 visa but other factors will be taken into account before a CAS number is allocated.		
Approval dates:	Course(s) validated / Subject to validation	July 2016	
	Course specification last updated and signed off	July 2016	
Professional, Statutory & Regulatory Body accreditation	The BEng course is accredited by the Institution of Engineering and Technology and fully meets the academic requirements for registration as an Incorporated Engineer and partially meets the academic requirements for registration as Chartered Engineer .		

Reference points:	Internal	Corporate Strategy 2015-2020 Academic Quality and Enhancement Manual School Strategy LSBU Academic Regulations
	External	Competitions and Markets Authority Guidance SEEC Level Descriptors 2016 QAA -Subject benchmark statement Engineering, 2015 Framework for Higher Education Qualifications (QAA, 2015) THE ACCREDITATION OF HIGHER EDUCATION PROGRAMMES - UK Standard for Professional Engineering Competence (AHEP3 2014)
B. Course Aims and Features		
Distinctive features of course	<p>The BEng Computer Engineering course combines the expertise of Electrical and Electronic Engineering, Computer Science and Informatics. It is distinctive in that it teaches the theory of computer engineering coupled with the required hardware and software tools and systems engineering approach to design that enable graduates to tackle complex engineering projects that are common place in our society. The course offers the opportunity to explore a wide range of computer engineering applications and design and develop software, hardware and networking systems for a variety of fields in today's fast-changing marketplace.</p> <p>The course, founded on thorough engineering principles and practice, covers computer hardware and software engineering, digital systems, embedded systems, computer and network design and software development in a variety of modern programming languages. It will equip students to exploit the expected exponential growth in highly connected devices and systems. The study and practice of innovation and enterprise enhances student's prospects of employment and consultancy in a wide range of industries, or of running their own business.</p> <p>This course offers a balanced programme of computer hardware and software engineering and covers various specialty areas supported by core modules in analysis, mathematics and engineering science. Students will gain a wealth of experience in using industry-standard equipment, computer programming and simulation packages. It is a hands-on course with strong emphasis on both theory and practice and opportunities to gain practical experience by solving real-world problems. This course has strong professional links: LSBU and IBM are strategic partners and are collaborating on the content of this course.</p> <p>The first two years cover the core topics in computer engineering through taught modules and continuous assessment. The final year includes the individual project, in addition to a wide range of compulsory and optional taught modules that allow students to focus on some of the more advanced areas of computing.</p> <p>At the end of the second year of the BEng (Hons) Computer Engineering course students will be given the possibility to transfer onto the MEng course. There's also the possibility of a year in industry in their third year, and LSBU will assist students in finding a suitable placement.</p>	

<p>Course Aims</p>	<p>The programme shares with other BEng Honours engineering programmes the aim to produce engineering graduates who have demonstrated the following abilities.</p> <ul style="list-style-type: none"> • Systematic understanding of key aspects of their field of study, including acquisition of coherent and detailed knowledge, at least some of which is at, or informed by, the forefront of defined aspects of a discipline. • Ability to deploy accurately established techniques of analysis and enquiry within a discipline. • Conceptual understanding that enables them: <ul style="list-style-type: none"> ▪ To devise and sustain arguments, and/or to solve problems, using ideas and techniques, some of which are at the forefront of a discipline. ▪ To describe and comment upon particular aspects of current research, or equivalent advanced scholarship, in the discipline. • Appreciation of the uncertainty, ambiguity and limits of knowledge. • Ability to manage their own learning and to make use of scholarly reviews and primary sources (for example, refereed research articles and/or original materials appropriate to the discipline). • Ability to apply the methods and techniques that they have learned to review, consolidate, extend and apply their knowledge and understanding, and to initiate and carry out projects. • Be able to critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), to make judgments, and to frame appropriate questions to achieve a solution - or identify a range of solutions - to a problem. • Know how to communicate information, ideas, problems and solutions to both specialist and non-specialist audiences. • Have the qualities and transferable skills necessary for employment requiring: <ul style="list-style-type: none"> ▪ The exercise of initiative and personal responsibility. ▪ Decision-making in complex and unpredictable contexts. ▪ The learning ability needed to undertake appropriate further training of a professional or equivalent nature. • Understand the role of, and have skills in, Engineering Applications, as defined by the Engineering Council and the IET, setting their educational experience in the context of work, the working of industry; the creation and lifecycle of products. • Appreciate the importance of developing their professional career (all students are encouraged to join the IET as student members, indeed the Division subsidises membership). • Be able to apply a professional engineering approach in their activities including innovation and enterprise. <p>Specific to BEng (Hons) in Computer Engineering (CEng)</p> <p>The BEng Computer Engineering programme aims to produce graduates who have acquired and can use a broad base of active knowledge in the field of computer engineering and the skills necessary to update, extend and deepen it for career development or further study; this includes:</p> <ul style="list-style-type: none"> • Appropriate mathematics requirements including discrete structures, computer engineering and circuits theory.
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	<ul style="list-style-type: none"> • Appropriate science requirements (The scientific method, Basic physics concepts in electricity and magnetism). • Digital and analogue electronics, computer hardware and software engineering. • Software engineering, design methodologies and computer programming skills. • The theory and applications of networking, security, signal processing, embedded systems, operating systems and the present trends in computer engineering. • Produce graduates who possess the ability to design computers, computer-based systems and networks that include both hardware and software and their integration to solve advanced engineering problems, subject to trade-offs involving a set of competing goals and constraints.
Course Learning Outcomes	<p><u>Program Specific Learning Outcomes (UKSPEC)</u></p> <p>1. Knowledge and Understanding</p> <p>A1: Knowledge and understanding of scientific principles and methodology necessary to underpin their education in their engineering discipline, to enable appreciation of its scientific and engineering context, and to support their understanding of historical, current, and future developments and technologies.</p> <p>A2: Knowledge and understanding of mathematical principles necessary to underpin their education in their engineering discipline and to enable them to apply mathematical methods, tools and notations proficiently in the analysis and solution of engineering problems.</p> <p>A3: Ability to apply and integrate knowledge and understanding of other engineering disciplines to support study of their own engineering discipline.</p> <p>Teaching and learning strategies:</p> <p>A1: Acquisition starts in first year lectures and tutorials concentrating on the essentials of science and mathematics. The Engineering Principles module covers the essential physics behind the study of thermodynamics, electrical circuits, mechanics, materials and matter. This work continues in the Principles of Electronics and Computer Engineering module which covers the science behind the principles of analogue, digital electrical and electronic circuits as well as computer engineering fundamentals including an overview of the hardware of a computer system and an introduction to database systems. In years 2 and 3 this appreciation of scientific principles in engineering continues as constraints on circuit and apparatus performance become evident. Specialist modules at level 6 develop these in the context of the engineering discipline. For example, Software and Hardware Engineering modules develop the behaviour of systems which is governed by underlying scientific principles.</p> <p>A2: This is covered by the mathematics module, which teaches the mathematical techniques and tools needed to model, understand and predict the science behind engineering designs and operations. In year 2 these techniques are continued in another module which covers discrete structures and mathematics where studies cover more advanced mathematical</p>

and computational techniques including algorithms, numerical methods and optimisation techniques. Mathematics and modelling is carried on in more subjects such as Computer Networks at level 5 and at level 6 Embedded Systems and the Internet of Things (series of lectures) and Digital Systems Design. Additionally, the module Engineering Software C++ covers Discrete Mathematics to support data structures and other more specialised modules.

A3: The acquisition starts in year 1 with practical examples in the use and interfacing of internetworking devices and computer networks, data transmission and networking design software tools in Data Communications and Networks module. This is covered further in the teamwork design exercises in the Design and Practice module, where integration of electronic design and hardware and software engineering is introduced for product prototyping. The Digital Systems and Microprocessor Design and Innovation and Enterprise modules in years 2 and 3 also utilise design problems in the areas of digital systems and software engineering and they further include a wide variety of computer engineering subjects. At level 7 this is also covered by the specialist modules such as Machine Learning, Systems and Cyber Threats. Additionally, the multidisciplinary nature of the level 6 individual project explores this integration of engineering discipline more than other modules. Students undertaking their project are routinely required to demonstrate their knowledge from other engineering fields.

Assessment

A1, A3: Assessment of the knowledge base is through examinations, mini tests and assignments, which frequently demand that the student extend knowledge of a subject by self-learning.

A2: Underpinning the understanding of their engineering discipline is assessed via assignments and laboratory activity. Emphasis is made on producing a design component in assignments as well as written examinations.

A3: Ability to apply and integrate knowledge is assessed by larger scale project work as well group assignments (where appropriate) and logbooks. Additionally in written examination emphasis is placed on producing conceptual design solutions to projects that span across engineering disciplines.

2. Intellectual Skills

B1: Understanding of engineering principles and the ability to apply them to analyse key engineering processes.

B2: Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques.

B3: Ability to apply quantitative methods and computer software relevant to engineering discipline, in order to solve engineering problems.

B4: Understanding of and ability to apply a systems approach to engineering problems.

	<p>Teaching and learning strategies: Acquisition of B1 and B2 is achieved by study in year 1 of electronic circuit theory, electromagnetic and electrostatic fields, analogue and digital electronic components and circuits, Data Communications and Networks, internetworking, database design, Internet Applications and an introduction to computer programming using specific tools such as Matlab. Engineering Principles introduces the foundations of units, temperature, pressure, heat transfer, forces, motion, friction, SHM, electric and magnetic fields and these are explored further in Principles of Electronics and Computer Engineering module. This continues in years 2 and 3 via the study of Computer Architecture and Operating Systems, Engineering Software C++ and Object-Oriented Software Design and Network Programming at level 5, Innovation and Enterprise, Advanced Computer Engineering at level 6 and other specialist modules. These 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 Fourier, Laplace and z-transforms and on the software engineering site UML diagrams, software design tools.</p> <p>The B3 learning outcomes are achieved in year 1 within the Engineering Principles and mathematics modules where for example, node and mesh analysis and matrix manipulation methods are taught. In year 2 computer-based mathematical tools such as Matlab/Simulink or Mathcad/VisSim are used to solve problems, including matrix inversion, iterative techniques, finite difference analysis of nodes and meshes (Engineering Computing module). Students use industry standard software circuit analysis and design as well as Networking, Computer programming tools, Operating Systems, Mobile and Sybersecurity applications in years 2 and 3 for quantitative analysis of performance, to evaluate scenarios, and produce designs. The level 6 individual project requires acquisition of quantitative analysis and software skills to complete and demonstrate understanding of the work undertaken.</p> <p>The B4 learning outcome is achieved after the basic design building blocks have been taught and understood in earlier years. A generic approach to systems is found in Team Design Project at level 5 where systems thinking, and the Hard Systems Methodology are covered within the context of project management. Several modules at higher levels utilise systems design strategies to achieve their goal.</p> <p>Assessment B1: Engineering analysis skills in applying the knowledge base are assessed in tutorials. The more extended skills are assessed via assignments and project reports. B2: Modules at levels 5 and 6 see progressively more design based and systems analysis questions in examinations.</p>
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B3: Level 6 individual project offers the best chance for students to demonstrate their ability to apply a systems approach to solving engineering problems. At levels 5 and 6, laboratory workshops and assignments are often based on analysing systems performance in modules such as Advanced Computer Engineering, Embedded Systems and the Internet of Things.

3. Practical Skills

This involves the practical application of engineering skills, combining theory and experience, and the use of other relevant knowledge and skills.

Students must be able to demonstrate:

C1: Understanding of contexts in which engineering knowledge can be applied (e.g. operations and management, technology development, etc.).

C2: Extensive knowledge of characteristics of particular materials, equipment, processes, or products.

C3: Workshop and laboratory skills including ability to Communicate their work to technical and non-technical audiences.

C4: Understanding use of technical literature and other information sources.

C5: Awareness of nature of intellectual property and contractual issues.

C6: Understanding of appropriate codes of practice and industry standards.

C7: Awareness of quality issues.

C8: Ability to work with technical uncertainty.

Teaching and learning strategies:

The achievement of **C1**, **C4** and **C5** is facilitated mainly by the Team Design Project module that covers planning, research and communication process in project management but also in other modules. The ability to understand and use technical literature along with the understanding of intellectual property, starts in the professional and industrial thread in year 1 Design and Practice module and gradually builds throughout the course, to include the coverage of industry standards, regulatory and environmental impact issues in the Standards, Specifications and Emerging Technologies series of lectures at level 6.

The **C2** outcome is delivered in year 1 by the study of different materials and measurement principles in the Engineering Principles module along with use of CAD tools and measurement equipment in the Design and Practice module. This continues throughout the course where characteristics of communication equipment and systems are covered in later technical modules.

C3 is acquired through a large number of modules where laboratory activity is recorded in logbooks. At level 4 in Design and Practice a general approach to engineering workshop and laboratory work is taken. In later years this activity continues with more technically specific laboratory, design and computer-based workshops which include practical investigations, design exercises and simulations to develop more advanced skills.

The industrial codes of practice and quality issues of **C6** and **C7** are similarly covered in the professional modules on the course and in some other modules.

	<p>Working with uncertainty, outcome C8 is introduced in the year 1 practical sessions, with its theory being covered in the year 1 Mathematics module. In the project module at level 6, students are expected to discuss their outcomes in terms of error predictions, measurements and the optimisation of technical uncertainties.</p> <p>Assessment</p> <p>C1: is assessed specifically via standard logbooks and reports based on laboratory activity.</p> <p>C2: is assessed by laboratory exercises and tutorial assignments.</p> <p>C3: is assessed by design assignments and also some exercises and tests in the early modules, and later by forming part of the checklist of elements for which marks are awarded in the assessment of small and larger projects.</p> <p>C4: is assessed by project work where students are required to provide background information as well as suitable referencing for their assignment.</p> <p>C5 and C6: are formally assessed in year 1 in simple 'design and make' exercises. Further development of these skills is taught and assessed in Team Design Project module and indirectly assessed through design assignments in specialist modules at level 6. Additionally these are assessed in the level 6 individual project that includes assessment by presentation and viva-voce examination.</p> <p>C7: is specifically assessed through examination in Embedded Systems and the Internet of Things and further optional modules selected from the Electrical and Electronic Engineering stream or the Computer Science stream, at level 6. It is also indirectly assessed by work on the individual project at level 6.</p> <p>C8: is assessed in design exercises during tutorial session and assignments and also at level 6 in the individual project work.</p> <p>4. Transferable Skills</p> <p>Design is the creation and development of an economically viable product, process or system to meet a defined need. It involves significant technical and intellectual challenges and can be used to integrate all engineering understanding, knowledge and skills to the solution of real problems.</p> <p>D1: Investigate and define a problem and identify constraints including environmental and sustainability limitations, health and safety and risk assessment issues;</p> <p>D2: Ensure fitness for purpose for all aspects of the problem including production, operation, maintenance and disposal;</p> <p>D3: Identify and manage cost drivers; Manage the design process and evaluate outcomes. Work individually and as part of a team.</p> <p>D4: Knowledge of management techniques, which may be used to achieve engineering objectives within that context;</p> <p>D5: Awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues;</p> <p>Teaching and learning strategies:</p>
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	<p>D1: Essential design constraints including environmental and sustainability considerations are introduced at level 4 through the Design and Practice module, which is common to all engineering programmes. Team design project at level 5 also contains material on resources and budgets for engineering project management. Design exercises in specialist modules at levels 5 and 6, also focus on environmental, sustainability and health and safety compliance.</p> <p>D2: Fitness of purpose as well as life-cycle product management are considered in modules in the professional and industrial thread and also in specialist modules.</p> <p>D3: Cost as a factor in design is taught at levels 5 in modules that deal with project management and at level 6 through design of computer systems from specifications and user requirements.</p> <p>D3: Managing the design process and evaluating outcomes features in many modules where the design thread runs in order to enable students to exercise their ability to be creative in providing solutions to engineering problems.</p> <p>D1 to D3 are also addressed in varying degrees in the level 6 individual project, where students are expected to find fit for purpose creative solutions by managing and applying the design processes taught in earlier years. An evaluation of the outcomes of their solution is required.</p> <p>D4 is acquired in Design and Practice at level 4 and at higher levels through team design project at level 5 and at level 6 Industry focused modules. Sustainable development is introduced at level 4 in Design and Practice. Further work is done at higher levels through design components in modules that embody systems features and components.</p> <p>D5 is acquired at level 4 in Design and Practice, and continues at level 5 through team design project.</p> <p>Depending on its particular emphasis, aspects of D4 and D5 will also be acquired in the level 6 individual project.</p> <p>D4 is taught and developed in project-oriented modules at level 5 as well as the specialist modules at level 6.</p> <p>Assessment</p> <p>D1 is assessed specifically via standard logbooks and some exercises and tests in the early modules, and later by forming part of the checklist of elements for which marks are awarded in the assessment of small and larger projects. These are formally assessed in year 1 in simple 'design and make' exercises. Further development of these skills is more indirectly assessed, in that significant achievement in these areas is necessary for the highest marks, particularly in project work at level 6, which includes assessment by presentation and viva-voce examinations.</p> <p>D3 is assessed by design assignment reports at different levels across modules that have a strong design component.</p> <p>D2 is assessed via engineering reports and presentations. Some modules specifically employ practical simulation exercises as a major part of the assessment. Project management plays a primary role in assessment of the major level 6 individual project, both in an initial (progress) report and</p>
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	<p>in the final report which has to describe the projects process activity.</p> <p>D1 is further assessed by project reports and presentations by teams and individuals.</p> <p>In early years D4 is assessed primarily by log books and assignments based on tutorial work and laboratory activity. In years 3 and 4, these are assessed by the project modules assessment criteria.</p> <p>D5 is assessed by assignments which are based on tutorial work and laboratory session and which require formal design based on user requirements.</p> <p>D4 is assessed in project work, through various components including presentation session and viva-voce examination.</p> <p>Computer Engineering Graduates must have developed transferable skills, additional to those set out in the other learning outcomes, that will be of value in a wide range of situations, including the ability to:</p> <ol style="list-style-type: none"> 1. Apply their skills in problem solving, communication, working with others, information retrieval and the effective use of general IT facilities. 2. Demonstrate the theoretical knowledge to solve problems in new technologies and develop new analytical techniques. 3. Demonstrate successful application of the knowledge to deliver innovative products and services and/or take technical responsibility for complex engineering systems. 4. Be able to demonstrate accountability for project, finance and personnel management and managing trade-offs between technical and socio-economic factors. 5. Demonstrate skill sets necessary to develop other technical staff as well as effective interpersonal skills in communicating technical matters. 6. Plan self-learning and improve performance, as the foundation for lifelong learning/CPD 7. Monitor and adjust a personal programme of work on an on-going basis. 8. Exercise initiative and personal responsibility, which may be as a team member or leader. <p>Those additional general skills are applied and described in individual modules and can be seen on module descriptors where they are applicable.</p>
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C. Teaching and Learning Strategy

General Learning Outcomes (UK-SPEC)

Knowledge and Understanding:

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.

Teaching and learning strategies:

Acquisition of knowledge and understanding is in the main through the following modules:

- Engineering Principles L4
- Principles of Electronics and Computer Engineering L4
- Object-Oriented Software Design and Network Programming L5
- Engineering Software C++ L5
- Team Design Project L5

- Innovation and Enterprise L6
- Network Technologies and Design L6

All of these modules teach and develop knowledge and understanding within a multidisciplinary engineering context and those at higher levels involve a degree of commercial awareness through design of systems to specifications.

Assessment

Assessment is through examinations and also practical work and assignments using logbooks and formal reports.

Intellectual Abilities:

Graduates must be able to apply appropriate quantitative science and engineering tools to the analysis of problems. They must be able to demonstrate creative and innovative ability in the synthesis of solutions and in formulating designs. They must be able to comprehend the broad picture and thus work with an appropriate level of detail.

Teaching and learning strategies:

Acquisition of IA is gained through the level 5 Team Design Project as well as the level 6 individual project. In these modules students are taught the appropriate tools to solve engineering problems. Innovation is covered in the module entitled Innovation and Enterprise at level 6 which develops business ideas from innovative research and development activities.

Assessment

Assessment of IA is through presentations and also formal reports at various stages of project work including a feasibility study. Innovation and design skills are assessed by group work as well as a formal report.

Practical skills:

Graduates must possess practical 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; in design 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. However, individual professional bodies may require particular approaches to this requirement.

Teaching and learning strategies:

Acquisition of practical skills is required during the practical laboratory sessions which constitute a part of nearly every module for this course. These include Data Communications and Networks laboratory, CAD laboratory, computer programming laboratories and computer-based session in all software development and computer programming modules, Digital Systems and Microprocessor Design laboratory, Computer Networks laboratory, Embedded Systems and the Internet of Things laboratory. All networking modules are also computer-based laboratories. Computer Architecture and Operating Systems as well as Cybersecurity and Cryptography offer a variety of computer-based laboratory in hardware and in operating systems. Further development of these skills is required in the level 6 individual project.

Assessment

PS is assessed by log books, coursework assignments and also the level 6 individual project which include presentation and a viva voce examination.

General Transferable Skills (GTS):

Graduates must have developed transferable skills that will be of value in a wide range of situations. These are exemplified by the Qualifications and Curriculum Authority Higher Level Key Skills and 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 foundation for lifelong learning/CPD.

Teaching and learning strategies:

Acquisition of GTS is achieved through communication of knowledge in formal reports. These constitute a part of the assessment for the majority of modules on the course to include,

- Computer Architecture and Operating Systems L5
- Computer Networks L5
- Digital Systems and Microprocessor Design L5
- Team Design Project L5
- Advanced Computer Engineering L6
- Innovation and Enterprise L6
- Mobile Computing L6

Assessment

GT skills are assessed by formal reports, presentations and viva voce examinations of the level 6 individual project.

Teaching and Learning overview

The course is made up of several modules (see section G below) and each module is delivered through a combination of lectures, tutorials, practical workshops, computing workshops etc all of which amounts to directed teaching (class room contact). There is a variance in the make up of the number of hours dedicated to lectures, workshops etc but the total number of study hours attracted by each module is dependent on the module weighting in credits. Typically, a 20-credit module, attracts 200 hours of learning which constitutes both directed learning and independent learning.

Independent Learning

The number of hours of independent learning required is dependent on the nature of the module. Generally, the number of hours of independent learning required increases as you progress from your first year (L4) to final year (L6). Typically, in most taught modules, the directed teaching varies between a third (65 hours at L4) to a quarter (52 hours at L6). This may significantly vary in some modules such as Mathematics or Computer Programming where more support is offered and Project modules where more individual involvement is expected.

Subject-related and generic resources

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 Library website (<http://www1.lsbu.ac.uk/library/>).

Learning Support

To support students in their learning journey, academic and support staff are available during the normal operating hours of the university via prior appointment. Academic staff also operate surgery sessions 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 run until 8/9pm and the relevant and required areas are open for access as timetabled.

All students are allocated a Personal tutor when they begin their study at LSBU and your personal tutor is who you would see about **any** problems, not just academic ones (most academic problems will probably be dealt with by module teachers or Course Directors).

Students are advised to establish contact with their personal tutor ASAP, if for some reason you have not done this at during the enrolment and orientation process.

Teaching staff

Most modules are delivered by full-time academic staff from within the parent division where the course resides and often by staff from other areas with in the school or university where expertise lies. Occasionally, PG students or part-time 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.

VLE

Each course has a course site, where relevant information is posted by the respective course director.

Each module on the course has a Module site and all relevant teaching and learning material such as module guides, lecture notes, teaching slides, tutorial and seminar sheets, workshop exercises, past exam papers etc are made available by the module leader. The virtual learning environment (Moodle) can be accessed using your windows login credentials and can be accessed from any internet connect PC inside or outside of the campus.

D. Assessment

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

Each module has a number of assessment *components*, usually, but not always, two. These can consist of assignments, mini tests, essays, laboratory reports and logbooks and examinations of various kinds. The assessment components for each module are specifically defined and kept up to date in the current Module Guides. Note that a component is not necessarily a single piece of work - several pieces of coursework (often referred to as a portfolio) may constitute a single component of the module assessment.

To pass a module, students must obtain an overall **module mark of no less than 40%** and also a minimum **threshold mark of 30% in each component**. The weighting of each component in calculating the overall module mark is given in the Module Guide, and your module coordinator will often cover the details of this at the beginning of the module.

Progression means moving on from one year to the next, during your studies. You need to complete (pass) all modules taken/studied at that level by obtaining the minimum component marks and the minimum module marks. Occasionally, with the discretion of the exam board, you may be allowed to progress with an outstanding module(s) and your course director will explain you in detail about these. It is important that you understand how progression works and what the rules are. The rules about progression and what happens if you fail modules are carefully set out (along with all the other University rules) in your Student Handbook, a copy of which is handed to you during enrolment.

The rules about referrals, repeats and extenuating circumstances are defined by the University's Academic Regulations for Taught Programmes and are described in the Student Handbook and also included in your course guide.

E. Academic Regulations

The University's Academic Regulations apply for this course. Any course specific protocols will be identified here.

Course specific protocols are usually prescribed by the professional bodies, accrediting the relevant courses. The IET is the professional body that accredits this course and the specified protocol supersedes any applicable universities protocols.

The IET's protocol, relating to this course, requires that the resit mark for a module is capped to a maximum of 40% in the absence of a supported extenuating circumstances claim. Where a claim made by the student is supported by the university's extenuating circumstances panel, the student receives a full uncapped mark and such an attempt is termed as a deferral, as against a referral.

F. Entry Requirements

Course Entry requirements for BEng (Hons) Computer Engineering

To be considered for entry to the course applicants will be required to have the following qualifications:

Full-time/Part-time students

- A Level BBB including Mathematics (120 UCAS points) **or**;
- BTEC National Diploma DDM, including Level 3 Mathematics (128 UCAS points) **or**;
- EAL Technical Extended Diploma in Engineering Technologies, D, including Further Engineering Mathematics; Electrical and Electronic Principles and other options relevant to Electronics/Computer Engineering/Systems **or**;
- Access to HE qualifications with 24 Distinctions and 21 Merits, with at least half the course in Mathematics and related subjects (122 UCAS points) **or**;
- Equivalent level 3 qualifications worth 120 UCAS points and including Mathematics **and**
- Applicants must hold 5 GCSEs A-C including Maths and English or equivalent (reformed GCSEs grade 4 or above) **or**;
- 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, **and** a Mathematics qualification equivalent to reformed GCSE grade 4 or above, as assessed by UK NARIC

Accredited Prior Learning/Transfer Credit

Applicants may be considered for entry to the second year of the course with the following qualifications. Applicants will normally be interviewed and may be required to sit a Mathematics test to ensure their preparedness for direct entry.

Full-time/Part-time students

- BTEC Higher National Diploma in Electrical and Electronic Engineering or a closely-related subject **or**;
- DipHE in a directly-relevant subject **or**;
- Transfer of 120 Level 4 credits from a directly-equivalent degree course and with the approval of the director of that course **or**;
- An overseas qualification assessed by UK NARIC as equivalent to at least BTEC HND in a closely-related subject **and** an IELTS score of 6.5 or equivalent.

Applicants may be considered for entry to the third year of the part-time course with the following qualifications and will be interviewed to ensure their preparedness for direct entry.

Part-time students

- Foundation Degree (FdEng) in a directly-related subject, **or**;
- Exceptional performance on the part-time HND in Electrical and Electronic Engineering at London South Bank University with the recommendation of its course director

Applicants may be considered for entry to the final year of the full-time course only under the following circumstances and will be interviewed to ensure their preparedness for direct entry.

Full-time students

- Transfer from another IET-accredited course with the approval of the director of that course

Direct entry to the final year of the part-time course is not possible.

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.

Application to the course

Full-time: via UCAS

Part-time: direct to the university, via a dedicated webpage

G. Course structure(s)

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.
- Semester-1 starts in Sep and the 12 teaching weeks happen before the Christmas break begins in mid-December, Christmas break lasts for 3 weeks. Upon return in January, students have a week of revision sessions, followed by 2 weeks of exams.
- Semester-2 follows immediately after the sem-1 exams and typically this occurs in the last week of January/First week of Feb. Sem-2 runs until mid-May (with 3 weeks of Easter break in Mar/April). The sem-2 teaching is followed by a week of revision and 2 weeks of exams. Students typically finish all their session by mid-June with examination results published before mid-July.
- Resit exams for sem-1 are scheduled during the Easter break and for sem-2 during the last week of August.
- The BEng course is made up of 360 credits. The course is made up of several modules, most modules attract 20 credits except for the BEng project module which is weighted double and attracts 40 credits.
- The BEng scheme is offered in full-time (3 year) mode, with further options of sandwich industrial training (4 year), or year in Europe (e.g. Germany, 4 year). Students undertake study of 120 credits per year.

- Selection for the MEng route occurs at the end of year 2, at which point students are expected to have passed all modules and have achieved an average mark of not less than 55% without benefit of compensated passes.

- The sandwich year alternatives involve a one-year placement away from the School between the second and third years of academic study and offered only on the FT programs. The placement year is not compulsory and is not assessed. However, students who undertake a placement with a relevant company/industry are required to maintain a portfolio and an academic staff member of the division will ensure a visit is taken place to the placement location during the duration of the placement. The student is expected to lead on finding the placement (short summer placement or year-long sandwich placement) and the university will provide all possible support but will not guarantee finding a placement. It is sometimes possible to undertake a short placement during the summer break, in which case there is no need to inform the university, but it is recommended to inform your course director for future reference as it can be useful when seeking a reference from your course director at the end of your course while seeking employment or further study.

- The part-time BEng course is delivered across 4 years (Sandwich option not offered). The breakdown of credits are Y1-100 credits; Y2-80 credits, Y3-100 credits, Y4-80 credits. The attendance days are Y1-Monday, Y2-Tuesday, Y3-Thursday and Y4-Friday. Typically, the day starts at 9am and finishes at 8 or 9pm.

BEng(Hons) Computer Engineering – Full time

The BEng study involves L4 to L6 study.

		Semester 1		Semester 2	
Level 4 120 credits	Engineering Mathematics and Modelling, L4 compulsory				20
	Principles of Electronics and Computer Engineering, L4 compulsory				20
	Design and Practice, L4 compulsory				20
	Engineering Principles, L4 compulsory	20		Introduction to Data Communications and Networks, L4 compulsory	20
				Engineering Computing, L4 compulsory	20
Level 5 120 credits	Team Design Project, L5 compulsory				20
	Computer Architecture and Operating Systems, L5 compulsory				20
	Digital Systems and Microprocessor Design, L5 compulsory	20		Engineering Software C++, L5 compulsory	20
	Object-Oriented Software Design and Network Programming, L5 compulsory	20		Computer Networks, L5 compulsory	20
Level 6 120 credits	Innovation and Enterprise, L6 compulsory	20		Embedded Systems and the Internet of Things, L6 option	20
	Network Technologies and Design, L6 option	20		Advanced Computer Engineering, L6 option	20
	Project, L6 compulsory				40

BEng(Hons) Computer Engineering – Part time

The BEng study involves L4 to L6 study (Y1 to Y4).

	Semester 1		Semester 2	
Year 1 100 credit s	Engineering Mathematics and Modelling, L4 compulsory			20
	Principles of Electronics and Computer Engineering, L4 compulsory			20
	Design and Practice (Distance Learning), L4 compulsory			20
	Engineering Principles, L4 compulsory	20	Data Communications and Networks, L4 compulsory	20
Year 2 80 credit s	Computer Architecture and Operating Systems, L5 compulsory			20
	Digital Systems and Microprocessor Design, L5 compulsory	20	Computer Networks, L5 compulsory	20
			Engineering Computing, L4 compulsory	20
Year 3 100 credit s	Team Design Project, L5 compulsory			20
	Object-Oriented Software Design and Network Programming, L5 compulsory	20	Engineering Software C++, L5 compulsory}	20
	Innovation and Enterprise, L6 compulsory	20	Embedded Systems and the Internet of Things, L6 option	20
Year 4 80 credit s	Network Technologies and Design, L6 option	20	Advanced Computer Engineering), L6 option	20
	Project L6, compulsory			40

Placements information

The sandwich year alternatives involve a one-year placement away from the School between the second and third years of academic study and offered only on the FT programs. The placement year is not compulsory and is not assessed. However, students who undertake a placement with a relevant company/industry are required to maintain a portfolio and an academic staff member of the division will ensure a visit is taken place to the placement location during the duration of the placement. The student is expected to lead on finding the placement (short summer placement or year-long sandwich placement) and the university will provide all possible support but will not guarantee finding a placement. It is sometimes possible to undertake a short placement during the summer break, in which case there is no need to inform the university, but it is recommended to inform your course director for future reference as it can be useful when seeking a reference from your course director at the end of your course while seeking employment or further study.

H. Course Modules

- All modules on the following list are core (compulsory) modules plus optional modules;

Module Code	Module Title	Level	Semester	Credit value	Assessment	
					CW%	EX%
ENG_4_401	Engineering Mathematics and Modelling L4	4	1&2	20	50	50
ENG_4_402	Engineering Principles L4	4	1	20	40	60
ENG_4_403	Design & Practice L4	4	1&2	20	100	
ENG_4_ECE	Principles of Electronics and Computer Engineering L4	4	1&2	20	100	
ENG_4_405	Engineering Computing L4	4	2	20	100	
ENG_4_531	Introduction to Data Communications and Networks L4	4	2	20	30	70
ENG_5_536	Computer Networks	5	2	20	30	70
ENG_5_OSN	Object-Oriented Software Design and Network Programming	5	1	20	100	
ENG_5_411	Engineering Software C++ L5	5	2	20	100	
ENG_5_414	Team Design Project L5	5	1&2	20	100	
ENG_5_494	Digital Systems and Microprocessor Design L5	5	1	20	30	70
ENG_5_CAO	Computer Architecture and Operating Systems	5	1&2	20	30	70
ENG_6_422	Innovation and Enterprise L6	6	1	20	100	
ENG_6_538	Advanced Computer Engineering	6	2	20	30	70
ENG_6_ESI	Embedded Systems and the Internet of Things	6	2	20	30	70
ENG_6_537	Network Technologies and Design	6	1	20	30	70
ENG_6_980	Individual Project L6	6	1&2	40	100	

I. Timetable information

Full-time students are usually timetabled between 9am and 6pm and the teaching spans out typically across 3 to 4 days in a week, with Wednesday afternoon, where possible, reserved for extracurricular activities.

Part-time students are usually timetabled for a day and the same evening of their attendance day (see section G for information on attendance days). The day usually lasts until 8pm or 9pm.

The timetables are made available to students at least 2 weeks before commencement of the semester. Students are however advised to check their timetables via MyLSBU, more frequently, in the early weeks of the semester, where there are usually some changes to rooms and/or re-arrangement of sessions.

Any changes to the timetable after the start of the term are also circulated by the respective module leaders and course directors.

J. Costs and financial support

Course related costs

- The course fee is the fee published by the university's fee office. Field trips and placement activities, where organised, may cost extra and are not compulsory to attend but students are advised to utilise the opportunities where possible.

- Cost of books and other learning materials is also not included in the course fee. Learning resources are usually made available through VLE (Moodle) and the library holds copies of books recommended as core reading.

-
The course can be found on the LSBU webpage by following the link below:

<https://www.lsbu.ac.uk/courses/course-finder/computer-engineering-beng-hons>

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> or
- <http://www.lsbu.ac.uk/courses/postgraduate/fees-and-funding>
- Information on living costs and accommodation can be found by clicking the following link- <https://my.lsbu.ac.uk/my/portal/Student-Life-Centre/International-Students/Starting-at-LSBU/#expenses>

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Appendix A: Curriculum Map

Appendix B: Educational Framework (undergraduate courses)

Appendix C: Personal Development Planning (postgraduate courses)

Appendix D: Terminology

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.

Modules			BEng Computer Engineering Course outcomes																			
			Knowl.&Unders t.			Intellectual Skills				Practical Skills								Transferable Skills				
L	Title	Code	A1	A2	A3	B1	B2	B3	B4	C1	C2	C3	C4	C5	C6	C7	C8	D1	D2	D3	D4	D5
4	Engineering Mathematics and Modelling	ENG_4_40_1		TA	TA												TA					
4	Engineering Principles	ENG_4_40_2	TA		TA	TA	TA	TA	TA	TA	TA	TA										
4	Design & Practice	ENG_4_40				TA						TA	TA	TA				TA	TA	TA	TA	TA
4	Introduction to Data	ENG_4_53	TA	TA		TA	TA	TA				TA	TA	TA	TA			TA				
4	Engineering Computing	ENG_4_40	TA	TA		TA	TA	TA			TA							TA		TA		
4	Principles of Electronics and Computer Engineering	ENG_4_EC_E	TA	TA	TA	TA	TA	TA	TA	TA		TA	TA		TA			TA				
5	Computer Architecture and Operating Systems	ENG_5_CA_O	TA	TAD	TA	TA	TA	TA	TA										TA			
5	Engineering Software C++	ENG_5_41_1	TAD			TA						TA										
5	Digital Systems and Microprocessor	ENG_5_49	TAD	TAD	TA	TA	TA	TA	TA			TA										
5	Object-Oriented Software Design and Network Programming	ENG_5_OS_N	TA	TA		TA	TA					TA										TA
5	Computer Networks	ENG_5_53	TA				TA	TA			TA	TA	TA	TA	TA	TA	TA	TA	TAD	TAD	TAD	TA
5	Team Design Project	ENG_5_41_4	TA				TA	TA			TA	TA	TA	TA	TA	TA	TA	TA	TA	TAD	TAD	TA
6	Network Technologies and Design	ENG_6_53	TA		TAD			TA	TA		TA						TA		TA			
6	Innovation and Enterprise	ENG_6_42	TAD	TAD	TA	TA	TA	TA	TA			TA					TA			TAD		
6	Embedded Systems and the Internet of Things	ENG_6_42_2	TA	TA	TA		TA	TA	TA	TA				TA		TA	TA	TAD	TA	TA		
6	Individual Project	ENG_6_42	A		TA			TA		A			TA						A	A	TA	TAD
6	Advanced Computer Engineering	ENG_6_53			TAD		TA	TA	TA				TA				TA		TA	TA		

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	<p><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.</p>	<p>Industrial Advisory boards, both at school level and division level, feeds into the curriculum design through its twice annually convened meeting.</p> <p>Representatives from professional bodies, are invited to a short seminar session as part of the module Design and Practice where students are informed about how they can engage with professional bodies and build relation with the local networking bodies to secure learning of state-of-the-art aspects of their discipline of engineering in the work arena and also to have access to facilities and professional networks operating in the local area. Students are encouraged to become student members of the professional body (IET) and the division pays for the membership to provide a sound start to their professional engagement.</p> <p>Alumni and employers are invited as guest speakers on the above module whose valuable inputs contribute to the student's ideas and activity which they later put use when competing on a national level in challenges such as the London Mayoral Challenge, Engineers without Borders etc.</p>
Embedded learning development	<p><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</p>	<p>Modules at L4 prepare form the basis for academic preparedness and help them with transition to later years in their course. For e.g.,</p> <p>The mathematics module provides the underpinning knowledge to enable them to think analytically. This is then reinforced in the Engineering computing module where mathematical modules taught in the Mathematics module are now</p>

	<p>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.</p>	<p>analysed and simulated using MATLAB Simulink models. This allows students to dissect the model deeper and gain a better understanding in terms of boundary conditions and constraints within which these analytical models can be validated.</p> <p>Academic writing, in its various forms is introduced and strengthened when they produce a variety of reports for the various modules they study at L4:</p> <ul style="list-style-type: none"> • As part of Design and Practice module, they produce individual and team reports, engage with a personal tutor, maintain record of their meetings, produce a portfolio etc. • As part of the Engineering computing module, they produce evidence of working on simulations through a comprehensive logbook and case study. • As part of the Intro to Digital Electronics, they produce a log book digitally and experience the submission of their records digitally through VLE and receive individual feedback via the VLE. • As part of the Principles to Electronics and Computer Engineering module, students experience the work place scenario where they are required to follow basic health and safety aspects related to working in places where death by electrocution is a hazard. They also maintain a hand-written record of their experience in the workshop while they progress through a set of times exercises. This helps them to put learning into practice in a timely and organised way whilst also recording data in a meaningful way and they are encouraged to pay attention to ease of retrievability of data. later.
<p>High impact pedagogies</p>	<p><u>Group-based learning experiences</u> The capacity to work effectively in teams enhances learning through working with peers and develops student outcomes, including communication, networking and respect for diversity of perspectives relevant to</p>	<p>The following modules, encourage and allow students to work in small groups of 2 to 3 in various settings, and experiencing various learning techniques be it peer learning, or communication and networking with their buddies and respect their diversity and individual perspectives:</p> <ul style="list-style-type: none"> • Design and Practice, • Engineering Computing

	<p>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.</p>	<ul style="list-style-type: none"> • Engineering Principles • Introduction to Data Communications and Networks • Principles of Electronics and Computer Engineering <p>Some module leaders, form groups where students are forced to work with random classmates in certain assignments and they are given a free choice to form groups for certain tasks.</p>
Inclusive teaching, learning and assessment	<p><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.</p>	<p>All teaching and learning materials are available as soft copies on the VLE in an appropriate accessible format. Module leaders also encourage students to approach them should they need the material in a different format.</p>
Assessment for learning	<p><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</p>	<p>The modules at L4 employ a range of course work assessments, categorised into formative or summative assessments that are integral to the learning and progression of all students.</p> <p>Formative assessments are important in the early years of a student’s journey on the course as this will provide an opportunity to quickly act on the formative feedback obtained and work to address weaknesses which then helps them to progressively gain better marks in the later part of that assessment and other assessments.</p> <p>Also, due to the nature of the subjects studied, sometimes summative assessment are more suitable as it takes time for students to develop their understanding of complex concepts and then fully put them into practice or use, in either a classroom exercise or a work-place related case study. In situations where summative assessments are undertaken, formative feedback forms part</p>

	<p>expectations and develops a commitment to excellence.</p>	<p>of the scheduled contact time/meetings between the students and member of academic staff. Feedback for summative assessments is generally provided to students within the recommended timeframe as per the school/university regulations, which is currently 2 weeks after submission.</p> <p>Summative assessments contribute with a lower weighting, to the final module mark. The weightings can range from 5 to 50% depending on the number and type of assessment components that form part of the course work for that specific module.</p>
<p>High impact pedagogies</p>	<p><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.</p>	<p>Students on this course are required to undertake small-scale independent enquiry-based study and contribute to either their individual projects/task or to a group/team project that they are part of.</p> <p>The module Design and Practice at L4, facilitates such aspects for students to experience as part of their individual and team tasks and also as part of the major design challenge that all students on the module undertake. The design challenge is more of a cross disciplinary nature and required groups to be constituted with students from different courses which allows them to work as an interdisciplinary team and enjoy the diversity of the team and raise to the challenging academic aptitude required.</p> <p>The Team Design Project module at L5 builds on the students' experiences and competencies gained in their L4 study and facilitates the teams to work on an open-ended, academically challenging aspect within the students own discipline where they are required to work as a team to undertake research (both individually and as a team) and explore creative and innovative solutions. They are also then required to present their working formally to their peers and lecturers. They also experience writing of reflective reports and undertake peer review/assessments which are moderated by the academic in charge of the session/project/task/module. Students on this module also experience the use of</p>

		<p>disseminating their work & ideas, using a range of techniques like posters, presentations, sketches etc.</p> <p>The above aspects feed into and further challenge the students when they undertake their individual project at L6.</p>
<p>Curricula informed by employer and industry need / Assessment for learning</p>	<p><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.</p>	<p>Students are invited to talks by alumni and the industrial advisory panel members, who often share their experiences and current issues in the industry, through case studies or presentations, relevant to the courses and this will help develop the understanding of students where they are able to see how their classroom knowledge can be transformed to provide solutions to problems in workplace.</p>
<p>Inclusive teaching, learning and assessment</p>	<p><u>Course content and teaching methods</u> <u>acknowledge the diversity of the student cohort</u> An inclusive curriculum incorporates images, examples, case studies and 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</p>	<p>Owing to the nature of the subject material, there will be little contribution based on cultural or social diversity among the students of the cohort. However, industry practices vary from country to country and since our student body is diverse and arrive from different countries, this then becomes contextual in their learning, for e.g. Earthing and Bonding techniques/arrangements are traditionally different in different countries and are also industry specific, so what is applicable to land-based equipment is not relevant to off-shore equipment etc</p>

	understanding of other viewpoints and identities.	
Curricula informed by employer and industry need	<p><u>Work-based learning</u> 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.</p>	<p>Direct Work based learning is not part of this course, however PT student who currently work will have the benefit of immediately putting their knowledge into practice.</p> <p>FT and PT students are often mixed in lectures and often contextually PT students share their work aspects and how they relate to the classroom learning, which is an important experience to FT students.</p> <p>Assignments where possible are designed to be based on case studies, which are close to real world scenarios and guest talks often feed into these.</p>
Embedded learning development	<p><u>Writing in the disciplines: Alternative formats</u> 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 understanding in the discipline. It is expected</p>	<p>The courses offer varying assessment aspects which supports students attempts to adopt ways of thinking and practising, which is underpinned by knowledge and skills gained, the formative feedback provided and the opportunities to put them into practice.</p> <p>Students also undertake a variety of presentation techniques, they are generally required to assimilate information while performing a task in the laboratory or during a group discussion and quickly note it down as a running commentary in a logbook for formal presentation. Further in their study, they are required to retrieve data from the information recorded which enables them to experience their own strengths and weaknesses associated with their personal style of recording information.</p> <p>In L6, they are also required to make sound judgements based on assimilated information and obtained data to then disseminate the information to a specific</p>

	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.	target audience in a specified style such as a poster, presentation, formal report etc to either a lay man, a competent co-worker, a consultant, a peer-reviewer, a professional body etc.
High impact pedagogies	<p><u>Multi-disciplinary, interdisciplinary or interprofessional group-based learning experiences</u></p> <p>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.</p>	Most of our student cohorts are very diverse and have varying entry qualifications and work in different sectors and are often working despite studying FT. This already brings in a rich and diverse perspective to the teams who work either on lab-based exercises, which are usual from L4 to L6, or on specific group tasks as part of the modules that contribute to the development of soft skills at L4/L5. This is further strengthened when they undertake an interdisciplinary team design project at L5 where the culmination of all the knowledge, skills, experiences, is expected to shape the outputs which requires strong inclusivity, communication and networking skills, to bring out the potential of each team member to the maximum benefit of the team.
Assessment for learning	<p><u>Variation of assessment</u></p> <p>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</p>	<p>The diversity and entry qualifications of the cohorts are considered when setting assessment which are approved by external examiners and are overseen by academic quality review processes, both through LSBU's internal reviews as well as period review at times of accreditation by the professional body.</p> <p>Variation to standard agreed assessments are possible but should be approved by the relevant external examiner and relevant professional body accrediting the course, the IET in this case.</p>

	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.	
Curricula informed by employer and industry need	<p><u>Career management skills</u></p> <p>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.</p>	<p>This course provides opportunities and support to enable students to gain general employability skills with help from the university's employability office, such as career planning, Career fairs etc</p> <p>Specific employability skills (few listed here) that are directly relevant to the industry are also developed as part of the course:</p> <ul style="list-style-type: none"> • In Engineering Computing, students are taught and trained to use MATLAB Simulink packages which are widely used in the industry and is an important competency to add to their CV.
Curricula informed by employer and industry need / Assessment for learning / High impact pedagogies	<p><u>Capstone project/dissertation</u></p> <p>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.</p>	<p>The individual BEng project undertaken at L6 will provide an opportunity for students to integrate and synthesise the knowledge and skills gained throughout their course which they are able to apply to real-world scenarios, be it research, or industry linked. This experience develops the students professionalism, integrity and creativity and prepares them to challenges in the real world when they undertake employment.</p>

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. Course teams are asked to indicate where/how in the course/across the modules this process is supported.

Approach to PDP	LEVEL 4	LEVEL 5	LEVEL 6
1 Supporting the development and recognition of skills through the personal tutor system.	All students allocated a personal tutor–coordinated by the Senior Personal Tutor. Personal tutoring is embedded in the level 4 module, Design and Practice where students are given the opportunity to learn about the aspects of PT on their courses. PT open surgeries are bookable on demand. Induction course, including: 1. Meeting with personal tutor 2. Use of library and learning resources (LIS) 3. Use of University IT facilities/Blackboard VLE 4. Study skills. 5. Access to University support facilities. 6. Induction to ‘Don’t Panic’ – PDP for L4.	Induction for direct entry students. See Level 4	At Level 6 CD and Project Supervisor support the PT system.
2 Supporting the development and recognition of skills in academic modules/modules.	Most modules have practical elements and this requires keeping a laboratory log book for each module. This occurs across all levels of the course but particular emphasis is placed on this aspect at L4 as logbooks provide a platform for further skills development such as report writing, dissertations and project management occurring at Levels 5 and 6. The following L4 modules have generic skills components, including	Following on from L4 students continue the practice of keeping log books but this is now complemented in technical modules at L5 by writing formal laboratory reports which requires other skills such as information retrieval and IT. This aspect is featured in the following modules: Computer	At L6 students keep log books but additional transferable skills are developed by setting longer assignments, dissertations and mini projects involving information selection, retrieval and evaluation, for example: Digital System Design L6, Innovation and Enterprise L6, Innovation and Enterprise L6, Individual Project L6.

	<p>keeping a laboratory logbook, team-working, planning and managing study: Mathematics, Design and Practice, Engineering principles, Principles of Electronics and Computer Engineering. In the core mathematics module practice is encouraged by continuous assessment and feedback (weekly) of tutorial logbooks. Remedial Maths tutorials – additional support is provided for mathematics to improve basic skills for those students with diverse entry qualifications.</p>	<p>Architecture and Operating Systems L5, Team Design Project L5, and Digital Systems and Microprocessor Design L5.</p>	
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<p>3 Supporting the development and recognition of skills through purpose-designed modules/modules.</p>	<p>Design and Practice – this module aims to introduce and develop the skills needed by professional engineers to enable them to make use of their technical knowledge, in particular:</p> <ul style="list-style-type: none"> • Develop students’ technical communications, basic report writing and team-working skills • Develop students’ skills in project planning and management • Develop students’ confidence in undertaking self-managed practical projects. 	<p>Team Design Project L5 prepares students for their role as professional engineers in a number of ways, including:</p> <ul style="list-style-type: none"> • Detailed study of project planning and networking techniques • Planning and preparation for the major project at L6 • Introduction to systems thinking • CV writing, evaluation and interview techniques. 	<p>Innovation and Enterprise – this module develops skills required to manage the process of gathering, analysing, criticizing and disseminating information which students will use in their engineering career. A series of weekly lectures in S1 provides students with guidance and practical advice to further develop specific skills such as information searches, referencing, software documentation, data presentation, and practical design, prototyping and testing. This module also develops project management skills of students.</p>
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<p>4 Supporting the development and recognition of skills through research projects and dissertation work.</p>	<p>A team project in Design and Practice concentrates on the processes necessary to produce and market an electronic product.</p>	<p>Mini-projects, assignments and dissertations are featured in modules at L5, including: Object-Oriented Software Design and Network Programming L5, Digital Systems and Microprocessor Design L5, Computer Networks L5. Team Design Project module specifically tasks a team of students to take a project from requirements through to design solution within their selected degree discipline.</p>	<p>The main individual Project will require the student to develop and demonstrate skills including:</p> <ul style="list-style-type: none"> • Project planning and time management • Keeping a detailed project log book • Technical report writing and presentation • Preparation of material and participation in an oral technical presentation session with other students and staff • Preparation for an individual oral examination (viva). <p>All of these components form part of the project assessment in addition to the technical aspects.</p>
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<p>5 Supporting the development and recognition of career management skills.</p>	<p>Students have an introduction to the engineering profession and professional bodies in Design and Practice.</p>	<p>Students attend a presentation about industrial placements and are given additional support to prepare their CV for potential placements. Additional preparation sessions are provided and students use the Careers office support services for interview training etc.</p>	<p>The IET representative gives a lecture on the graduate advantage to final year BEng students</p>
<p>6 Supporting the development and recognition of career management skills through work placements or work experience.</p>	<p>CDs make students aware of potential sandwich placements.</p>	<p>The Industrial Training Officer (ITO) assists students to obtain sandwich and summer work placements. The ITO visits students during their placement and they must maintain a daily log and compile a reflective and evaluative final report. They attend the placement meeting (see 5 above) to feedback to the following year's students. There is an exchange agreement with Hochschule Bremen and BEng students can spend their placement year in Germany.</p>	

<p>7 Supporting the development of skills by recognising that they can be developed through extracurricular activities.</p>	<p>The Widening Participation Module (WPU) gives talks to student cohorts to encourage individuals to join the University Student Ambassadors scheme and the Mentoring scheme in local schools. The school of engineering maintains a course Moodle (VLE) site including information about professional bodies and this is open to all students throughout their course. Students are encouraged to start their own 'clubs' and laboratory facilities and specific notice-boards are made available for this.</p>	<p>Students can study a language to prepare for exchange courses with overseas links.</p>	
<p>8 Supporting the development of the skills and attitudes as a basis for continuing professional development.</p>	<p>Students are encouraged to join the relevant professional body for the course.</p>	<p>See L4</p>	<p>Students are made aware of the need for CPD in the level 6 module Innovation and Enterprise</p>
<p>9 Other approaches to personal development planning.</p>			

<p>10 The means by which self-reflection, evaluation and planned development is supported e.g. electronic or paper-based learning log or diary.</p>	<p>Students must keep a personal technical logbook for each module with a laboratory or computer workshop component. This is marked periodically and returned with comments and advice. At L4 this forms the basis of the majority of the coursework mark in technical modules.</p>	<p>See L4. The logbook may form part of the coursework in some modules but this is supplemented by formal reports, mini-projects, and dissertations in most technical modules.</p>	<p>Project students meet their supervisors at least once/fortnight where progress is monitored and objectives are discussed. In the individual Project students are expected to keep a logbook, which provides a platform for skills development.</p>
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Appendix D: Terminology

[Please provide a selection of definitions according to your own course and context to help prospective students who may not be familiar with terms used in higher education. Some examples are listed below]

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 learning
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