Course Specification

A. Course Information			
Final award title(s)	M/BEng (Hons) Computer Systems and Networks Engineering (FT/PT)		
Intermediate exit award title(s)	BEng (Hons) Computer Systems and Networks Engineering Cert HE in Engineering Dip HE in Computer Systems and Networks Engineering		
UCAS Code (MEng)	H631	**Course Code(s)**	Full time 4618 Part time 4619
	London South Bank University		
School	☐ ASC ☐ ACI ☐ BEA ☐ BUS ☒ ENG ☐ HSC ☐ LSS		
Division	Electrical and Electronics Engineering		
Course Director	Dr Zhanfang Zhao		
Delivery site(s) for course(s)	☒ Southwark ☐ Havering ☐ Other: please specify		
Mode(s) of delivery	☒Full time ☒Part time ☒other please specify SANDWICH		

Length of course/start and finish dates

Mode	**Length years**	Start - month	**Finish - month**
	MEng		
Full time	4	Sep	June
Full time with placement/ sandwich year	5	Sep	June
Part time	6	Sep	June
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	Aug 2015
	Course specification last updated and signed off	April 2015
Professional, Statutory & Regulatory Body accreditation	The MEng course is accredited by the **Institution of Engineering and Technology** and **fully meets** the academic requirements for registration as a **Chartered Engineer.**	

	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.** (Accreditation visit took place in Nov 2017 and the course is accredited for a full 5-year period, until 2022 intake)	
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 Quality Code for Higher Education 2018 Framework for Higher Education Qualifications QAA Subject Benchmark Statement for Engineering (October 2019) UK Standard for Professional Engineering Competence (UK-SPEC, Third Edition)

B. Course Aims and Features

Distinctive features of course	This MEng course in Computer Systems and Networks Engineering offers a balanced programme of computer hardware, interface electronics, programming for real-time and embedded systems and telecommunications It is distinctive in that it teaches the theory of computer systems and networks 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 system and networking engineering applications and design and develop software, hardware and networking systems for a variety of fields in today's fast-changing marketplace. 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. 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. This MEng/BEng course encourages students to acquire a deeper understanding of the essential facts, concepts, theories and principles of electrical engineering and its underpinning science and mathematics. 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. Most of the engineering courses share a common first year, which offers to students the flexibility to change the degree programme if they desire. There's also the possibility of a year in industry in their third year, and LSBU will assist students in finding a suitable placement. The MEng course offers full accreditation for Membership of the Institution of Engineering and Technology registration as a Chartered Engineer. This

	is a four-year degree course that extends student studies to Master's level and provides them with greater breadth and depth of study which is the quickest and easiest way to become a Chartered Engineer (CEng). After the completion of this programme students can immediately pursue the necessary steps to obtain Chartered Engineer status which enhances employability and offers higher salaries. Chartered engineers (CEng) have the greatest level of responsibility for complete engineering projects and develop solutions to problems using new or existing technologies in a strategic role
Course Aims	The MEng (Hons) Computer Systems and Networks Engineering aims to produce engineering graduates who have demonstrated the following abilities. • 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: ▪ 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: ▪ 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 and achieve compliance to relevant industry regulations.

	Specific to MEng/BEng (hons) in Computer Systems and Networks Engineering (CSN) course The MEng CSN programme aims to produce graduates who have acquired and can use a broad base of active knowledge in the field of Computer Systems and Networks Engineering, and the skills necessary to update, extend and deepen it for career development or further study; this includes: • Demonstrate an enhanced knowledge of both the electronic hardware and the software engineering considerations, which affect the design of modern computer systems and networks, and in particular how one affects, the other. • Be able to design and implement a significant hardware/software system (the project requirement for CSN). • Know how to specify, configure and maintain modern computer networks with diverse technologies. • Possess diverse engineering skills to apply problem solving software and hardware systems and have the ability to contribute in the design of modern computer systems that often encapsulate a variety of engineering disciplines. • Appreciate the impact of operating systems on computer hardware and possess skills that will enable them to use multi-tasking operating systems and extend this concept across a network. • Demonstrate an enhanced knowledge of hardware architecture and software engineering considerations, which affect the design of modern computer systems and in particular, how one affects the other. • Manifest software engineering, design and programming skills that will enable them to design a variety of computer based systems to include, safety-critical and real-time systems, off-line simulation and systems modelling tools, CASE and CAD tools, communication protocol implementation, remote communication and data acquisition systems. • Appreciate the impact of technological advancement on project lifecycle management from conception through to commissioning and beyond, and so to evaluate different proposed solutions to problems and critically appraise the trade-offs between cost, performance, functionality, and legacy issues.
Course Learning Outcomes	The defined learning outcomes used in this course specification are those published by the Engineering Council in the UK Standard for Professional Engineering Competence (UK-SPEC): **Program Specific Learning Outcomes (UKSPEC)** **1. Knowledge and Understanding** **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. **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.

	A3: Ability to apply and integrate knowledge and understanding of other engineering disciplines to support study of their own engineering discipline. **Enhanced MEng learning outcomes:** **A1+A3-ENHANCED**: A comprehensive understanding of the scientific principles of own specialisation and related disciplines. **A4**: An awareness of developing technologies related to own specialization. **A5**: An understanding of concepts from a range of areas including some outside engineering, and the ability to apply them effectively in engineering projects. **A6**: An awareness of developing technologies related to own specialisation. **Teaching and learning strategies:** **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 circuits (electrical and electronics) 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 apparatus performance become evident. Specialist modules at level 7 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. **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. Mathematics and modelling is carried on in later years through subjects such as Computer Networks at level 5 and at level 6 Network Technologies and Design. **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 Systems and Software Engineering 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, the group 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. **A1+A3 (ENHANCED):** At level 4 this is covered in the modules Principles of Electronics and Computer Engineering and Data Communications and Networks. This carries on at level 5 with the modules Computer Networks and with Operating Systems, while at

level 6 it is taught and developed further in higher level modules such as Advanced Computer Engineering and in level 7 in modules such as Technical, Research and Professional Skills, Advanced Networking Technologies amongst others.
A4: This is covered in mathematics at level 4, and in specialist level 7 modules.
A5: This is covered in Team Design Project at level 5 and Innovation and Enterprise at level 6.
A6: This is covered in level 4 Design and Practice, level 5 team project and Level 6 individual project. Level 7 group project in-particular relates different disciplines through a group project allocated with this in mind.

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, A4: 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, A5: 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.
A6: This is assessed by examination at level 6 as well as project work at level 7.

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.
Enhanced MEng learning outcomes:
B5: Ability to use fundamental knowledge to investigate new and emerging technologies.
B3- ENHANCED: Ability to extract data pertinent to an unfamiliar problem, and apply its solution using computer based engineering tools when appropriate.
B6: Ability to apply mathematical and computer based models for solving problems in engineering, and the ability to assess the limitations of particular cases.

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 components and circuits, Data Communications and Networks, internetworking, database design, Internet Applications

	and an introduction to computer programming. Engineering Principles introduces the foundations of units, temperature, pressure, heat transfer, forces, motion, friction, SHM, electric and magnetic fields and these are explored further Principles of Electronics and Computer Engineering module. This continues in years 2 and 3 via the study of Operating Systems, Engineering Software and Object-Oriented Software Design and Network Programming at level 5, Systems and Software Engineering, Advanced Computer Engineering at level 6, Advanced Networking Technologies at level 7 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. 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 Cybersecurity applications in years 2, 3 and 4 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. 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. A number of modules at higher levels utilise systems design strategies to achieve their goal. **B5**: At level 4 this is introduced through Engineering Principles module. Here the trends in technological advances are introduced. Project based modules at higher levels focus on new developments and how these impact engineering practice. In particular innovation and enterprise at level 6 considers novel designs for problem solving. **B3-ENHANCED**: Unfamiliar problem solving is covered in innovation and enterprise at level 6. Other more technical aspects are undertaken in computer simulation work, also in hardware and software modules as well as Computer Networks and Mobile computing. **B6**: Many modules have a systems component and hence require students to learn to use mathematical and computer based models to solve problems. Most notable modules that do this are Operating Systems, Computer Networks at levels 5 and 6. Computer based models and Programming techniques are used in software modules such as Engineering Software, Data Structures and Algorithms and Object-Oriented Software Design and Network Programming.

Assessment

B1, B5: Engineering analysis skills in applying the knowledge base are assessed in tutorials. The more extended skills are assessed via assignments and project reports.
B2, B3-ENHANCED: Modules at levels 5, 6 and 7 see progressively more design based and systems analysis questions in examinations.
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, 6 and 7, laboratory workshops and assignments are often based on analysing systems performance.
B6: Mathematical modelling and simulation skills are assessed by coursework assignments and logbooks.

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.
Enhanced MEng learning outcomes:
C9: A thorough understanding of current practice and its limitations and some appreciation of likely new developments.
C10: Ability to apply engineering techniques taking account of a range of commercial and industrial constraints.

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. 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 modules at levels 6 and 7, students are expected to discuss their outcomes in terms of error predictions, measurements and the optimisation of technical uncertainties. **C9**: This is initially covered at level 4 through Design and Practice. Some work is also done in principles module. It is also covered in the Team Design Project that expects teams of students to specify and design real engineering solutions. Technical, Research and Professional Skills module as well as specialist modules at level 7 also cover this learning outcome. **C10**: This is mainly covered in modules teaching Computer Communications, Broadband access system and wireless network design, Software Engineering and computer programming and Hardware design that are often subject to commercial constraints. **Assessment** **C1**: is assessed specifically via standard logbooks and reports based on laboratory activity. **C2**: is assessed by laboratory exercises and tutorial assignments. **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. **C4**: is assessed by project work where students are required to provide background information as well as suitable referencing for their assignment. Level 7 Technical, Research and Professional Skills specifically addresses referencing and literature survey LOs. **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 levels 6 and 7. Additionally these are assessed in the level 6 individual and the level 7 group projects both of which include assessment by presentation and viva-voce examinations. **C7**: is specifically assessed through examination in Systems and Software Engineering also the group project at level 7. **C8**: is assessed in design exercises during tutorial session and well as assignments and also level 6 individual project work and level 7 group project. **C9**: This is assessed at level 5 by examination and at levels 6 and 7 by project assessment components.

C10: Assessed by report in project work. Feasibility study in technical, research and professional skills covers project costing and payback calculations.

4. Transferable Skills

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.

D1: Investigate and define a problem and identify constraints including environmental and sustainability limitations, health and safety and risk assessment issues;

D2: Ensure fitness for purpose for all aspects of the problem including production, operation, maintenance and disposal;

D3: Identify and manage cost drivers; Manage the design process and evaluate outcomes. Work individually and as part of a team.

D4: Knowledge of management techniques, which may be used to achieve engineering objectives within that context;

D5: Awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues;

Enhanced MEng learning outcomes:

D6: Wide knowledge and comprehensive understanding of design processes, risks involved and methodologies and the ability to apply and adapt them in unfamiliar situations.

D7: Ability to generate an innovative design for products, systems, components or processes to fulfil new needs.

D8: Extensive knowledge and understanding of management and business practices, their limitations, and how these may be applied appropriately to strategic and tactical issues.

Teaching and learning strategies:

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, 6 and 7, also focus on environmental, sustainability and health and safety compliance.

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.

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. At level 7 the specialist modules also consider project costing.

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.

D1 to D3 are also addressed in varying degrees in the level 6 individual project and also in the level 7 group 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. **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. At Level 7 the module Technical, Research and Professional Skills teaches risk analysis and this is supplemented by the level 7 group project 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. **D5** is acquired at level 4 in Design and Practice, and continues at level 5 through team design project. Depending on its particular emphasis, aspects of **D4 and D5** will also be acquired in the level 6 individual project. **D4, D8** are taught and developed in project-oriented modules at levels 5, 6 and 7 as well as the specialist modules at level 7. **D6** is covered in the common module entitled Design and Practice at level 4. User needs are covered in the Team Design Project module at level 5. It is also a major part of the level 7 group project. **D7:** Innovative technical solutions are taught in the design component of each specialist module, mainly at levels 6 and 7. **Assessment** **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 levels 6 and 7, which includes assessment by presentation and viva-voce examinations. **D6:** Practical laboratory sessions and software workshops provide a means to assess this through assignments and logbooks. Examinations are also used to challenge students to design a system based on specific (that are necessarily brief) user requirements. Students are encouraged to make design assumptions in order to demonstrate their understanding of the importance of requirements specification. **D3** is assessed by design assignment reports at different levels across modules that have a strong design component. **D2, D7** are 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 in the final report which has to describe the projects process activity. Similar assessment applies to level 7 group projects. **D1, D6** are assessed by project reports and presentations by teams and individuals. 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. **D5** is assessed by assignments which are based on tutorial work and laboratory session and which require formal design based on user requirements. **D4, D8** are assessed in project work, through various components including presentation session and viva-voce examination. 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: 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. Those additional general skills are applied and described in individual modules and can be seen on module descriptors where they are applicable.

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 SoftwareL5
- Team Design Project L5
- Systems and Software Engineering L6
- Advanced Computer Engineering L6
- Computer Network Design L7
- Future Internet Technologies L7
- Advanced Networking TechnologiesL7

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. The module on technical, research and professional skills at level 7 carries this stage further. The level 7 group project challenges students to cope with tasks that are broad in scope and detailed in context making them very complex.

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 and Mobile Computing 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 thee skills is required in the level 6 individual project and level 7 group project.

Assessment

PS is assessed by log books, coursework assignments and also the level 6 individual project and level 7 group project both of which include presentation and a viva voce examination.

General transferable skills:

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,

- Operating Systems L5
- Computer Networks L5
- Digital Systems and Microprocessor Design L5
- Team Design Project L5
- Advanced Computer Engineering L6
- Innovation and Enterprise L6
- Digital Systems Design L6
- Advanced computer networks L6
- Technical Research and Professional Skills L7
- Future Internet Technologies L7

These skills are also developed during work on the level 7 group project.

Assessment
GT skills are assessed by formal reports, presentations and viva voce examinations of the level 6 individual project and also level 7 group projects.

In addition to these and in respect of general transferable skills, the following enhanced outcomes should be expected of MEng Degree graduates:

• The ability to develop, monitor and update a plan, to reflect a changing operating environment;
Teaching and learning strategies:
Acquisition of these skills is through the module entitled Technical, Research and Professional Skills. The module on Innovation and Enterprise also deals with assessing opportunities of technologies within the business context.
Assessment
Assessment is by way of a formal report in the relevant modules.
• The ability to monitor and adjust a personal programme of work on an on-going basis, and to learn independently;
Teaching and learning strategies:
Acquisition of these skills is through the module entitled Technical, Research and Professional Skills as well as project-based modules at levels 5, 6 and 7.
Assessment
Assessment is by way of a formal report in this module where students are required to perform a feasibility study in a discipline relevant to their degree.
• The ability to exercise initiative and personal responsibility, which may be as a team member or leader;

Teaching and learning strategies:
Acquisition of these skills is through the team group project at level 5 and also the major group project module at level 7.
Assessment
Assessment of these is through the group project assessment stages as outlined in the module descriptor.
• The ability to learn new theories, concepts, methods etc and apply these in unfamiliar situations.
Teaching and learning strategies:
Acquisition of these skills is through the module on Innovation and Enterprise. Here students are expected to consider innovative technology ideas derived from academic areas and assess these for suitability in a commercial environment.
Assessment

Assessment of these is through formal reports associated with this module as well as a group presentation.

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/L7). Typically, in most taught modules, the directed teaching varies between a third (65 hours at L4) to a quarter (52 hours at L6 & L7). This may significantly vary in some modules such as Mathematics 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 within 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 resources such as module guides, lecture notes, presentation 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 connected PC inside or outside of the campus.

D. Assessment

Course work in modules can be either formative or summative and the details are 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 several 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 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, on the course. 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 are also included in your course guide.

E. Academic Regulations

The London South Bank University's Academic Regulations apply for this course and a current version can be accessed at http://www.lsbu.ac.uk/__data/assets/pdf_file/0008/84347/academic-regulations.pdf . Any course specific protocols will be identified here.

The full list of London South Bank University's policies and procedures can be access at https://www.lsbu.ac.uk/about-us/policies-regulations-procedures

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 LOCAL protocols supersedes any applicable university's 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 MEng (Hons) Computer Systems and Networks 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 AAB including Mathematics (136 UCAS points) **or;**
- BTEC National Diploma DDD, including Level 3 Mathematics (144 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 **or;**
- Access to HE qualifications with 36 Distinctions and 9 Merits, with at least half the course in Mathematics and Physical Science subjects (134 UCAS points) **or;**
- Equivalent level 3 qualifications worth 144 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 Computer/Telecommunications Engineering, 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 MEng course is made up of 480 credits, while the BEng has 360 credits. The course is made up of several modules, most modules attract 20 credits except for some project modules which are weighted double and attract 40 credits.

- The MEng scheme is offered in full-time (4 year) mode, with further options of sandwich industrial training (5 year), or year in Europe (e.g. Germany, 5 year). Students undertake study of 120 credits per year. The BEng schemes are similar but with one year less duration.

- 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 8/9pm.

The part-time MEng course is delivered across 6 years (Sandwich option not offered). The breakdown of credits and attendance days are the same as the BEng scheme listed above for the first 4- years. Y5 has 40 credits and Y6-80 credits on the MEng program and the attendance days are Y5-Wednesday and Y6-Friday.

BEng(Hons)/MEng(Hons) Computer Systems and Networks Engineering – **Full time**
The BEng study involves L4 to L6 study and the MEng study involves L7.

	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 & Practice L4, compulsory			20
	Engineering Principles L4, compulsory	20	Data Communications and Networks L4, compulsory	20
			Engineering Computing L4, compulsory	20
Level 5 **120 credits**	Team Design Project			20
	Computer Architecture and Operating Systems L5, compulsory			20
	Introduction to data communication & networks L5, compulsory	20	Engineering Software, Data Structures and Algorithms L5, compulsory	20
	Object-Oriented Software Design and Network Programming L5, compulsory	20	Computer Networks and Mobile Computing L5, compulsory	20
Level 6 **120 credits**	Systems and Software Engineering L6, compulsory	20	Network technologies and design L6, compulsory	20
	Innovation and Enterprise L6, compulsory	20	Advanced Computer Engineering L6, compulsory	20
	Project L6, compulsory			40
Level 7 **120 credits**	Technical Research & Professional Skills L7, compulsory	20	Advanced Networking Technologies or Systems - Cyber Threats, Vulnerabilities & Countermeasures L7	20
	Computer Network Design **or** Computer Vision and Image Processing	20	Cybersecurity and Cryptography or Future Internet Technologies L7	20
	Group Project L7, compulsory			40

BEng(Hons)/MEng(Hons) Computer Engineering – **Part time**
The BEng study involves L4 to L6 study (Y1 to Y4) and the MEng study involves L7 (Y5 & Y6).

	Semester 1		**Semester 2**	
Year 1	Engineering Mathematics & Modelling L4, compulsory			20
	Principles of Electronics and Computer Engineering L4, compulsory			20
	Design & Practice (Distance Learning) L4, compulsory			20
	Engineering Principles L4, compulsory	20	Data Communications and Networks L4, compulsory	20
Year 2	Computer Architecture and Operating Systems L5, compulsory			20
	Introduction to data communication & networks L5, compulsory	20	Computer Networks and Mobile Computing L5, compulsory	20
			Engineering Computing L4, compulsory	20
Year 3	Team Design Project L5, Compulsory			20
	Object-Oriented Software Design and Network Programming L5, compulsory	20	Engineering Software, Data Structures and Algorithms L5, compulsory	20
	Innovation and Enterprise L6, compulsory	20	Network Technologies and Design L6, compulsory	20
Year 4	Systems and Software Engineering L6, compulsory	20	Advanced Computer Engineering L6, compulsory	20
	Project L6, compulsory			40
Year 5	Computer Network Design (EEB-7-876) **or** Computer Vision and Image Processing (EEB_7_CVP)	20	Advanced Networking Technologies ENG-7-540 or Systems - Cyber Threats, Vulnerabilities and Countermeasures L7	20
Year 6	Technical Research & Professional Skills L7, compulsory	20	Cybersecurity and Cryptography or Future Internet Technologies L7	20
	MEng Group Project L7, 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

- Modules on the following list are core (compulsory) modules plus optional modules;
- There are various optional modules on current MEng (Hons) Computer Engineering course.

Module Code	Module Title	Level	Sem	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	Data Communications and Networks L4	4	2	20	30	70
ENG_5_CNM	Computer Networks and Mobile Computing	5	2	20	30	70
ENG_5_OSN	Object-Oriented Software Design and Network Programming	5	1	20	100	
ENG_5_SDA	Engineering Software, Data Structures and Algorithms L5	5	2	20	100	
ENG_5_414	Team Design Project L5	5	1&2	20	100	
ENG_5_533	Introduction to data communication & networks L5	5	1	20	30	70
ENG_5_CAO	Computer Architecture and Operating Systems	5	1&2	20	30	70
ENG_6_539	Systems and Software Engineering	6	1	20	30	70
ENG_6_422	Innovation and enterprise	6	1	20	100	
ENG_6_537	Network technologies and design	6	1	20	30	70
ENG_6_538	Advanced computer engineering	6	2	20	30	70
ENG_6_980	Individual Project L6	6	1&2	40	100	
ENG_7_540	Advanced Networking Technologies	7	2	20	30	70
EEB_7_882	Technical Research and Professional Skills L7	7	1	20	100	
EEB_7_876	Computer Network Design	7	1	20	50	50
ENG_7_CCR	Cybersecurity and Cryptography	7	2	20	40	60
EEB_7_CVP	Computer Vision and Image Processing (EEB_7_CVP)	7	1	20	100	
CSI_7_SYS	Systems-Cyber Threats: vulnerabilities and countermeasures	7	2	20	100	
CSI_7_FIT	Future Internet Technologies	7	1	20	100	
ENG_7_431	Group Project L7	7	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

- provide information about other course-related costs (explain what is and what is not included in the tuition fees, e.g. such additional expenses as cost of books or other learning materials, specialist equipment, uniforms, clothing required for work placements, field trips, bench fees).

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

List of Appendices

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		Programme outcomes																											
			Knowledge and Understanding						Intellectual Skills						Practical Skills										Transferable Skills							
L	Title	Code	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	D1	D2	D3	D4	D5	D6	D7	D8
4	Engineering Mathematics and Modelling	ENG_4_401		TA	TA	TA								TA								TA								
4	Engineering Principles	ENG_4_402	TA		TA		TA		TA	TA	TA	TA	TA		TA	TA	TA						TA								
4	Design & Practice	ENG_4_403							TA								TA	TA	TA				TA	TD	TA	TA	TA	TA	TA	TA	TA	
4	Data Communications and Networks	ENG_4_531	TA	TA			TA		TA	TA	TA						TA	TA	TA	TA					TA					TA		TA
4	Engineering Computing	ENG_4_405	TA	TA					TA	TA	TA			TA		TA								TD	TA		TA					
4	Principles of Electronics and Computer Engineering	ENG_4_ECE	TA	TA	TA	TA	TA		TA	TA	TA	TA			TA		TA	TA		TA					TA					TA		
5	Computer Architecture and Operating Systems	ENG_5_CAO	TA	TAD	TA	TA			TA	TA	TA	TA		TA												TA						
5	Engineering Software, Data Structures and Algorithms	ENG_5_SDA	TAD					TA	TA								TA															
5	Introduction to communication systems and networks	ENG_5_533	TA	TA	TA	TA	TA		TA	TA	TA				TA		TA								TA							
5	Object-Oriented Software Design and Network Programming	ENG_5_OSN	TA	TA					TA	TA				TA			TA												TA			
5	Computer Networks and Mobile Computing	ENG_5_CNM	TA			TA		TAD		TA	TAD					TAD	TA	TAD	TA	TAD	TAD	TA	TA		TA	TAD	TAD	TAD	TA	TA	TA	TAD
5	Advanced Engineering Mathematics and Modelling	ENG_5_410	TA		TA				TAD	TA	TA	TA		TA			TA															
5	Team Design Project	ENG_5_414	TA			TA		TAD		TA	TAD					TAD	TA	TAD	TA	TAD	TAD	TA	TA	TD	TA	TAD	TAD	TAD	TA	TA	TA	TAD
6	Innovation and Enterprise	ENG_6_422	TAD	TAD	TA				TAD	TAD	TAD	TAD	TAD	TA			TA				TAD						TAD					
6	Systems and Software Engineering	ENG_6_539			TA	TA		TA		TA	TAD	TA			TA				TA		TA	TA			TAD	TA	TA			TA		

6	Individual Project	ENG_6_424	**A**		**TA**		**TA**	**A**			**TA**				**A**			**TA**					**A**	**A**		**A**	**A**	**TA**	**TA D**	**A**	**A**	**TA**
6	Network technologies and design	ENG_6_537	TA	TA					TA	TA	TA				TA		TA															
6	Advanced Computer Engineering	ENG_6_538			TA D	TAD	TA	TA		TAD	TAD	TA						TA			TA		TA			TA	TA			TA		
7	Cybersecurity and Cryptography	ENG_7_CCR	**TA**	**TA**	**TA**				**TA**							**TA**		**TA**							**TA**	**TA**						
7	Technical Research and Professional Skills	EEB_7_882		**TA**	**TA**	**TAD**				**TA**	**TA**				**TAD**	**TA**	**TAD**	**TAD**		**TA**			**TA D**		**TA**		**TA**	**TA D**	**TA D**			**TA**
7	MEng Group Project L7	ENG_7_431			**TA**		**TA**	**A**	**A**		**A**			**TA**	**A**			**TA**							**TA D**	**A**	**TA D**	**TA**	**TA D**	**TA D**	**A**	**TA**
7	Advanced Networking Technologies	ENG_7_540	TA	TA					TA	TA		TA				TA									**TA**	**TA**						
7	Computer Network Design	EEB_7_876		TA			TA	TA			TAD	TA	TAD			TA	TA										TA			TA	TA	
7	Systems and Cyber Threats: vulnerabilities and countermeasures	CSI_7_SYS	TA	TA	TA		TAD	TAD			TAD	TA	TAD		TA								TA	TA	TA D	TA	TA		TA			TA D
7	Computer Vision and Image Processing	EEB_7_CVP	**TA**	**TA**	**TA**				**TA**	**TA**	**DA**					**D**									**TA**					**D**	**D**	
7	Future Internet Technologies	CSI_7_FIT	TA	TA	TA		TAD	TAD			TAD	TA	TAD		TA								TA	TA	TA D	TA	TA		TA			TA D

Appendix B: Embedding the Educational Framework for Undergraduate Courses

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

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

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

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

The dimensions of the Educational Framework for curriculum design are:

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

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

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

Dimension of the Educational Framework	Minimum expectations and rationale	How this is achieved in the course
Curricula informed by employer and industry need	<u>Outcomes focus and professional/employer links</u> All LSBU courses will evidence the involvement of external stakeholders in the curriculum design process as well as plan for the participation of employers and/or alumni through guest lectures or Q&A sessions, employer panels, employer-generated case studies or other input of expertise into the delivery of the course provide students with access to current workplace examples and role models. Students should have access to employers and/or alumni in at least one module at level 4.	Industrial Advisory boards, both at school level and division level, feeds into the curriculum design through its twice annually convened meeting. 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. 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.
Embedded learning development	<u>Support for transition and academic preparedness</u> At least two modules at level 4 should include embedded learning development in the curriculum to support student understanding of, and	Modules at L4 prepare form the basis for academic preparedness and help them with transisiton to later years in their course. For e.g.,

	familiarity with, disciplinary ways of thinking and practising (e.g. analytical thinking, academic writing, critical reading, reflection). Where possible, learning development will be normally integrated into content modules rather than as standalone modules. Other level 4 modules should reference and reinforce the learning development to aid in the transfer of learning.	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 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. 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: • 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 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 encourage to pay attention to ease of retrievability of data
High impact pedagogies	<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	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: • Design and Practice, • Engineering Computing

	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.	• Engineering Principles • Data Communications and Networks • Principles of Electronics and Computer Engineering 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.
Inclusive teaching, learning and assessment	<u>Accessible materials, resources and activities</u> All course materials and resources, including course guides, PowerPoint presentations, handouts and Moodle should be provided in an accessible format. For example, font type and size, layout and colour as well as captioning or transcripts for audio-visual materials. Consideration should also be given to accessibility and the availability of alternative formats for reading lists.	All 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.
Assessment *for* learning	<u>Assessment and feedback to support attainment, progression and retention</u> Assessment is recognised as a critical point for at risk students as well as integral to the learning of all students. Formative feedback is essential during transition into university. All first semester modules at level 4 should include a formative or low-stakes summative assessment (e.g. low weighted in final outcome for the module) to provide an early opportunity for students to check progress and receive prompt and useable feedback that can feed-forward into future learning and assessment. Assessment and feedback	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. 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. 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

	communicates high expectations and develops a commitment to **excellence**.	situations where summative assessments are undertaken, formative feedback forms part 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. 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.
High impact pedagogies	<u>Research and enquiry experiences</u> Opportunities for students to undertake small-scale independent enquiry enable students to understand how knowledge is generated and tested in the discipline as well as prepare them to engage in enquiry as a highly sought after outcome of university study. In preparation for an undergraduate dissertation at level 6, courses should provide opportunities for students to develop research skills at level 4 and 5 and should engage with open-ended problems with appropriate support. Research opportunities should build student autonomy and are likely to encourage **creativity** and problem-solving. Dissemination of student research outcomes, for example via posters, presentations and reports with peer review, should also be considered.	Students 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. 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 then to work as an interdisciplinary team and enjoy the diversity of the team and raise to the challenging academic aptitude required. 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 heir 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 disseminating their work & ideas, using a range of techniques like posters, presentations, sketches etc. The above aspects feed into and further challenge the students when they undertake their individual project at L6 and their group project at L7.
Curricula informed by employer and industry need / Assessment *for* learning	<u>Authentic learning and assessment tasks</u> Live briefs, projects or equivalent authentic workplace learning experiences and/or assessments enable students, for example, to engage with external clients, develop their understanding through situated and experiential learning in real or simulated workplace contexts and deliver outputs to an agreed specification and deadline. Engagement with live briefs creates the opportunity for the development of student outcomes including **excellence**, **professionalism**, **integrity** and **creativity**. A live brief is likely to develop research and enquiry skills and can be linked to assessment if appropriate.	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.
Inclusive teaching, learning and assessment	<u>Course content and teaching methods acknowledge the diversity of the student cohort</u> An inclusive curriculum incorporates images, examples, case studies and other resources from a broad range of cultural and social views reflecting diversity of the student cohort in terms of, for example, gender, ethnicity, sexuality, religious belief, socio-economic background etc. This commitment to **inclusivity** enables students to recognise themselves and their experiences in the curriculum as well as foster understanding of other viewpoints and identities.	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 form 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

Curricula informed by employer and industry need	<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.	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. 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. 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.
Embedded learning development	<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 that assessment utilises formats that are recognisable and applicable to those working in the profession. For example, project report, presentation, poster, lab or field	The courses offers 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. 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 date from the information recorded which enables them to experience their own strengths and weaknesses associated with their personal style of recording information. In L6/L7, they are also required to make sound judgements based on assimilated information and obtained data to then disseminate the information to a specific 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.

	report, journal or professional article, position paper, case report, handbook, exhibition guide.	
High impact pedagogies	<u>Multi-disciplinary, interdisciplinary or interprofessional group-based learning experiences</u> Building on experience of group working at level 4, at level 5 students should be provided with the opportunity to work and manage more complex tasks in groups that work across traditional disciplinary and professional boundaries and reflecting interprofessional work-place settings. Learning in multi- or interdisciplinary groups creates the opportunity for the development of student outcomes including **inclusivity**, communication and networking.	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 L7, 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 group project at L7 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	<u>Variation of assessment</u> An inclusive approach to curriculum recognises diversity and seeks to create a learning environment that enables equal opportunities for learning for all students and does not give those with a particular prior qualification (e.g. A-level or BTEC) an advantage or disadvantage. An holistic assessment strategy should provide opportunities for all students to be able to demonstrate achievement of learning outcomes in different ways throughout the course. This may be by offering alternate assessment tasks at the same assessment point, for example either a written or oral assessment, or by offering a range of different assessment tasks across the curriculum.	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. 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.

Curricula informed by employer and industry need	<u>Career management skills</u> Courses should provide support for the development of career management skills that enable student to be familiar with and understand relevant industries or professions, be able to build on work-related learning opportunities, understand the role of self-appraisal and planning for lifelong learning in career development, develop resilience and manage the career building process. This should be designed to inform the development of **excellence** and **professionalism**.	This 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, Carrer fairs etc Specific employability skills (few listed here) that are directly relevant to the industry are also developed as part of the course: In Engineering Computing, students are taught and trained to used 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	<u>Capstone project/dissertation</u> The level 6 project or dissertation is a critical point for the integration and synthesis of knowledge and skills from across the course. It also provides an important transition into employment if the assessment is authentic, industry-facing or client-driven. It is recommended that this is a capstone experience, bringing together all learning across the course and creates the opportunity for the development of student outcomes including **professionalism**, **integrity** and **creativity**.	The individual BEng project undertaken at L6 and the MEng Group project undertaken at L7 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.

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	Level 7
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 Personal Tutor system.	The group project supervisor acts as personal tutor for the group of students that the staff member supervises. This enhances team work and allows the PT to interact with the group at two levels, personal as well as academic.
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, 6 and 7. The following L4 modules have	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 all the level 5 modules.	At L6 students keep log books but additional transferable skills are developed by setting longer assignments, case studies, dissertations and mini projects involving information selection, retrieval and evaluation, for example: innovation & enterprise, System & software engineering, network technologies and design, advanced computer engineering, individual Project L6.	At L7 students continue to keep log books but the focus is on reports that further develop transferable skills with formal reports, dissertations and mini projects involving information selection, retrieval and evaluation, for example: 1. Technical Research and Professional Skills L7 2. Advanced networking technologies L7 3. Group Project L7 in particularly focuses on group working aspects

	generic skills components, including keeping a laboratory logbook, team-working, planning and managing study: Mathematics, Design and Practice, Engineering Principles, Introduction to Electrical and Electronic 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.			which include organisation and management of projects.
3 Supporting the development and recognition of skills through purpose designed modules/modules.	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: • 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.	Team Design Project L5 prepares students for their role as professional engineers in a number of ways, including: • 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.	Innovation and enterprise – This module encourages students to question what they see and experience around with an aim to enhance the creativity to discover new and better ways of doing things. It aims to equip the students with methods and processes to recognise opportunities and to plan on harnessing commercially viable benefits that may exist from exploiting those opportunities in a sustainable fashion. This might be a product or service (such as consultancy or contract management). The application of project management principles will help to define the critical path of a proposed business and how the many processes involved are interlinked throughout the initial planning exercise and how they can change over time.	At level 7 the Technical, research and professional skills module further develops skills required to manage the process of gathering, analysing, criticizing and disseminating information which students will use in their engineering career. Students are taught how to perform a feasibility study on an engineering project within their degree discipline.

4 Supporting the development and recognition of skills through research projects and dissertations work.	A team project in Design and Practice concentrates on the processes necessary to produce and market an electronic/communication product.	Mini-projects, assignments and dissertations are featured in modules at L5, including: 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.	The main individual Project will require the student to develop and demonstrate skills including: • 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). All of these components form part of the project assessment in addition to the technical aspects.	At level 7, the group project where students Work as a part of a team to carry out a challenging and complex engineering design or investigation, through exploiting the expertise within a team and making informed judgements based on current engineering knowledge and 'state of the art' industrial practice. They further develop their skills to, • Project planning and time management • Keeping a detailed project log book • effectively communicate and critically evaluate observed results in a technical format.
5 Supporting the development and recognition of career management skills.	Students have an introduction to the engineering profession and professional bodies in Design and Practice.	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 (CaSEU) support services for interview training etc.	The IET representative gives a lecture on the graduate advantage to final year BEng students	The IET representative gives a lecture on the graduate advantage to final year MEng students
6 Supporting the development and recognition of career management skills through work placements or work experience.	CDs make students aware of potential sandwich placements.	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, Germany and Lucerne University, Switzerland. BEng students can		

		spend their placement year in Germany or Switzerland.		
7 Supporting the development of skills by recognising that they can be developed through extra curricula activities.	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 department maintains a course 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.	Students can study a language to prepare for exchange courses with overseas links.		
8 Supporting the development of the skills and attitudes as a basis for continuing professional development.	Students are encouraged to join the relevant professional body for the course.	See L4	Students are made aware of the need for CPD in the level 6 module Industry and Regulations.	Students are further reminded of the need for CPD in the level 7 module Technical, research and professional skills
9 Other approaches to personal development planning.				
10 The means by which self-reflection, evaluation and planned development is supported e.g. electronic or paper-based learning log or diary.	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.	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.	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.	This module requires the inputs of both technical and business elements. Course directors will arrange for students to form teams and will help to allocate staff to act as team supervisors throughout the module. Staff will hold regular meetings with each group to assist and guide. Students will be

				encouraged to use staff as a resource, as well as other facilities available within and outside the University.