Course Specification

A. Course Information			
Final award title(s)	BEng (Hons) Chemical and Energy Engineering		
Intermediate exit award title(s)	CertHE DipHE		
UCAS Code		**Course Code(s)**	FT 5582 Foundation 5916
	London South Bank University		
School	☐ ASC ☐ ACI ☐ BEA ☐ BUS ☒ ENG ☐ HSC ☐ LSS		
Division	Chemical & Energy Engineering		
Course Director	Dr Anna Karin Axelsson		
Delivery site(s) for course(s)	☒ Southwark ☐ Havering ☐ Other: please specify		
Mode(s) of delivery	☒Full time ☐Part time ☐other please specify		
Length of course/start and finish dates	(see table below)		

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

Is this course generally suitable for students on a Tier 4 visa?	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. International Office questionnaire updated	
Approval dates:	Course(s) validated	July 2019
	Course Review date	July 2024
	Course specification last updated and signed off	September 2021

Professional, Statutory & Regulatory Body accreditation	Institution of Chemical Engineers (IChemE) Accredited under old UG course 2018, brought over to new code until Aug 2023. PSRB accreditation will apply to Levels 4-6 only and not Foundation Year.	
Reference points:	Internal	-Corporate Strategy 2020-2025 -Academic Quality and Enhancement Manual -School Strategy -LSBU Academic Regulations
	External	-QAA Quality Code for Higher Education 2018 -Framework for Higher Education Qualifications (QAA, 2018) -Subject Benchmark Statements: Engineering 2018 -The Accreditation of Higher Education Programmes (AHEP-3 2014) -SEEC Level Descriptors 2021 -Competitions and Markets Authority Guidance
B. Course Aims and Features		
Distinctive features of course	The **Foundation Year** is distinctive in the way students are prepared with the specific knowledge and skills required to progress onto the BEng programme at LSBU. The foundation year is designed to respond to the differing needs of students, particularly those from local areas in accordance with the policies and practice of equal opportunities. The content is designed to help students to develop academic, study and practical skills needed at foundation level, including a combination of core engineering modules associated with the provision of study and laboratory skills, mathematics, engineering science and scientific principles and with the specialist engineering subject enabling students to progress to the BEng Chemical and Chemical and Energy Engineering courses offered by the Division of Chemical and Energy Engineering. The **BEng in Chemical and Energy Engineering** is distinctive in that it teaches the theory of chemical engineering coupled with computer simulation, laboratory practice and industrial placement that enable graduates to be well equipped with desired skills sought after by employers. This UG programme has the added value of introducing topics that important for the future energy mix with a focus on oil and gas and renewables. In the first year, students are introduced basic engineering design on the base of learning the knowledge of maths and engineering principles. The second year focusses on core unit operations such as fluid flow, thermodynamics, chemical reaction & separation, process simulation and control. After two-years study, the students can opt to having one year industrial placement. In final year, the course trains students in advanced topics in process safety and control, environmental protection and clean process technology. The students apply all the knowledge gained in their previous study into project design from raw materials to final desired product.	
Course Aims	The aims of the **Foundation Year** are: 1. To provide students with the academic and pastoral support to enable them to achieve the foundation content and progress to the BEng. 2. To deliver a content that include study and laboratory skills in an engineering environment offering the best possible opportunity for students to develop their practical, intellectual and personal skills.	

	3. To fosters students' enthusiasm for their specialist subject, enabling them to develop intellectual, personal, practical and transferable skills as a sound basis for progression into work or further study. 4. To give students an adequate level of scientific and numerical literacy, so that they can thus approach the more advanced content offered by the BEng course. 5. To integrate practical and theoretical aspects of the subject disciplines offered. 6. To develop students' practical scientific skills whilst promoting safe laboratory practices, enabling them to become confident technically proficient and responsible scientists. 7. To promote student appreciation of the need to work with accuracy, precision and reproducibility, with due regard for the need for accurate and verifiable records. 8. To enable students to continue to develop their range of skills and understanding of modern analytical methods, beyond this course. The **BEng Chemical and Energy Engineering** aims to: 1. Produce graduates trained in the core discipline of chemical engineering including energy, materials and reaction engineering, and project management. 2. To produce BEng graduates who are equipped with the relevant understanding, skills and knowledge required to operate effectively in chemical and energy engineering. 3. Produce graduates capable of contributing to the profession of chemical engineering in the context of modern industrial practice and sustainable development. 4. To enable students to develop an understanding of relevant disciplines associated with chemical and energy engineering in order to operate in multidisciplinary teams. 5. Develop students' knowledge of mathematics, applied sciences, engineering methods and safety, in support of the central themes of the course. 6. Develop students' intellectual and reasoning powers, their ability to perceive the broader perspective, and their problem-solving skills through the integration of a broad range of subject material. 7. Teach students to communicate clearly, to argue rationally and to draw conclusions based on an analytical and critical approach to data and systems. 8. To encourage the development of personal qualities and professional competences of chemical engineers with an emphasis for energy. 9. Develop the transferable skills expected of an honours graduate who will work in multi-disciplinary teams with technical, commercial and management staff in industrial and other occupations.
Course Learning Outcomes	**Foundation Year**

	A. Students will have knowledge and understanding of: A1. subject knowledge underpinning the major disciplines in engineering. A2. experimental methods and the development and testing of hypotheses. A3. methods used in the analysis, evaluation and critical review of evidence in engineering. A4. processes and procedures in sampling, data analysis and expressing precision, accuracy, and reproducibility. B. Students will develop their intellectual skills such that they are able to: B1. understand the role of rational argument. B2. appreciate the key features of a problem and suggest possible means of investigation. B3. be aware of the significance of hypotheses, experimental data and rational arguments. B4. apply a theory, concept, or subject-specific principle to a new context. C. Students will acquire and develop practical skills such that they are able to: C1. demonstrate safe practices and advise on safety procedures associated with a particular technique or methodology. C2. evaluate alternative methodologies for an investigation or completing a process. C3. organise and allocate duties, set targets, and evaluate progress in achieving a specific technical goal. C4. present data in a seminar or lecture C5. demonstrate competence in a range of basic statistical procedures C6. demonstrate competence in the use of word-processors, spreadsheets, and data presentation packages. D. Students will acquire and develop transferrable skills such that they are able to: D1. manage and adapt their work schedule and learning strategy. D2. adopt skills and techniques to address a particular problem. D3. be aware of the full range of sources of information, citing references properly. D4. appreciate the need and begin to communicate ideas, arguments and concepts in a rational and systematic way, using a variety of media; D5. assume responsibility for their own learning and work independently. D6. manage and monitor their role within a group working to meet specific targets. **<u>BEng Chemical and Energy Engineering</u>** A. Students will have knowledge and understanding of: A1. Mathematics, science and engineering underlying the practice of chemical engineering. A2. The interactions involved in chemical engineering systems and analytical and computational tools to deal with these.

	A3. The scope of chemical engineering from the molecular to the large scale. A4. The economic, management and statutory requirements involved in the practice of chemical engineering. B. Students will develop their intellectual skills such that they are able to: B1. Use mathematics, science and engineering to support theoretical and practical analysis of process operations. B2. Employ concepts from the applied and engineering sciences creatively to design industrial processes and equipment. B3. Show awareness of the significance of scale-up techniques in design work. B4. Use fundamental knowledge to investigate new and emerging technologies. B5. Extract data pertinent to an unfamiliar problem, and apply in its solution using computer based tools when appropriate. B6. Integrate engineering principles of a multi-disciplinary nature in order to propose solution to problems. B7. Apply management and business practices appropriately. B8. Produce engineering solutions which are consistent with ethical and social responsibilities. C. Students will acquire and develop practical skills such that they are able to: C1. Use computers and current software in quantitative and analytical work, as well as general information technology for communication and data handling. C2. Plan and manage work both individually and in teams. Communicate effectively using appropriate media. C3. Evaluate designs and systems to identify areas of potential hazard and environmental threat and propose improvements. C4. Use laboratory, engineering and measuring equipment to provide data in support of theoretical understanding. C5. Analyse and solve engineering problems, often on the basis of limited and imperfect data. Critically apply scientific evidence based methods in the solution of problems. C6. Apply principles of project management. D. Students will acquire and develop transferrable skills such that they are able to: D1. Manipulate, sort and present data in forms useful for understanding. Select, interpret and validate data, identifying possible errors and inconsistencies D2. Communicate clearly the findings of experiments, projects and other assignments using written reports, oral and visual presentations. D3. Work effectively in a team, recognising the roles played by different team members. D4. Manage own responsibilities, including time and task management. D5. Undertake self-development and the capacity to learn. D6. Identify and solve problems in familiar and unfamiliar situations. D7. Adapt to change in the working environment.

C. Teaching and Learning Strategy

Foundation Year

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

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

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

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

Safe practice in laboratories begins with the first semester module Study & Laboratory Skills and is further reinforced through the stream specialist module in semester two (C1, C3). These modules develop confidence in the laboratory and relate experimental activities to scientific understanding.
In all modules there are some methodological components and techniques, even if there is no practical element associated with the teaching and learning, coursework exercises are used in some modules to assess student understanding of these techniques, often as part of a tutorial or group-work session.

A key emphasis of the integrated foundation year is the development of the student’s practical and analytical skills through both subject-specific and generic practical.
Students are inducted into teamwork skills in the Study & Laboratory Skills module and part of their assessment of this module is to produce a reflective account of their experiences in the laboratory (C1). Students are encouraged to consider alternative ways to approach specific problems, or to address specific questions (C1, C2, C3), typically through their practical work. This way student are able to build their confidence in their technical and practical skills and reinforce the basic concepts delivered in the associated lecture programme. The stream specialist module integrates many of the previous learned skills, and also requires the students to analyse and present their data in a standard scientific manner. Student must organise their schedule of work in consultation with the module leader and bring their project to conclusion with a properly presented report (C3-C6).
The required skills are fully mapped through the curriculum, and each is met by the combination of modules undertaken. A number of tasks assessed in both the Study & Laboratory Skills and Scientific Principles for Engineering modules measure their progress in managing their own learning (D1, D5) and to work effectively as part of a team (D6). These all require a flexible approach to data

acquisition, interpretation and presentation, not least because of the range of topics being covered (D1). Presentations and seminars are used extensively in semester 2. The second semester project work again is seen as serving an important test of many of these skills (D1-D5).

All students are allocated a personal tutor on initial enrolment to the course. The personal tutor is the point of contact for all matters relating to the student's welfare and progress whilst at London South Bank. The personal tutors are supported by the course director. All tutees will meet their course team at the start and throughout the course.
The primary teaching contact with students, in classrooms, laboratories and workshop, is supported by online resources available on the VLE Moodle for each module.
For their general understanding of the course, students can access a course guide and a summary of the syllabus; these are updated annually and available online.
For each module, the module leader provides a module guide. Students have access to books in the Perry library, based on the information of core and optional resources recommended in the reading list available for each module.

BEng (Hons) Chemical and Energy Engineering

- **A.** Lectures, tutorials and laboratory practical, especially at Level 4, cover A1. The behaviour of systems, A2, is introduced in classes at all levels, and is a feature of Design Project work. The Design Project work also shows the scope of the discipline, A3.
  Much of the understanding of A4 will be gained in specific modules, mainly at levels 5 and 6. Statutory requirements, including safety, feature throughout the course, in practical work in particular.
  Students are encouraged to attend the seminars/event such as those organised by IChemE. Also, invited speakers will deliver presentations at LSBU on relevant and current topics in chemical engineering.
- **B.** Most of the curriculum will support B1-B8; These intellectual skills learning outcomes are developed through lectures, individual and group problem-based work, including the Design Project. In private study, students will develop skills by writing laboratory reports, and solving problems set by the tutor or in past examinations, case studies, and projects.
  Learning outcome, B5, is developed in computer laboratory sessions embedded in modules and projects.
- **C.** Learning outcomes in C1 are developed in computing skills for engineering and science in practical workshops at level L4 and L5. Students also learn the principles and study the application of specialist engineering packages at L6 .
  C2 and C3 will be major part of small projects embedded in some modules and in the Design Project where students will receive guidance on application of principles studied earlier.
  C4 will be acquired in practical workshop and laboratory sessions.
  The final year Design Project, L6, will be open-ended, developing the outcomes C5 and C6.
- **D.** D1 is developed in laboratory practical work and design tasks; students for example obtain data from handbooks and computer databases, and use it in calculations, graphical solutions and computer applications.
  D2 and D3: report-writing and team-working skills are developed in laboratory and project-oriented modules throughout the course. D4-D7 developed along the course.

D. Assessment

- **A.** Summative assessment: Content, knowledge and understanding is assessed through coursework, or coursework and examination. Coursework can take many forms (based on the practical or theoretical content of the module) including essays, reports, group work, oral presentations, production of posters, and in-class tests. Examinations normally take the form of a 2 or 3-hour unseen end-of-semester paper.

Formative assessment includes: tutorials exercises, simulation exercises, discussions in classroom, questions and answer sessions, peer discussions, observations, reflection on learning, presentation rehearsals.

B. Intellectual skills are normally assessed through formal examinations, student presentations and individual viva voce examination. Preparation of laboratory and project reports will also contribute.

C. C1 will be assessed through computing assignments, C2-C6 as parts of the major project assessment, and C4 in the marking of laboratory reports. C5-C6: projects will be marked for a critical approach to problem-solving.
A variety of assessment methods are used to assess transferable skills. These include computer laboratory exercises and simulations, oral presentations, written reports, and final project.

D. For instance: D1 is assessed in many of the written examination papers, also laboratory and project reports. Laboratory teachers give students considerable feedback on the quality of written laboratory reports, D2; students discuss this feedback with their personal tutors. The effectiveness of teamwork, D3, is assessed as an element in the major project.

E. Academic Regulations

1. Assessment regulations

The University's Academic Regulations apply for this course. For course specific protocols please refer to the School of Engineering /Division of Chemical and Energy Engineering protocol document

2. Support for students

The University places a high priority on providing support for students. This support is provided by a combination of services, both centrally in the University and locally at the programme level. Much of the support focuses on developing students' skills to enhance their performance on the programme and to facilitate their transition to employment.

2.1 Programme and course level support:

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

The primary teaching contact with students, in classrooms, laboratories and workshop, is supported by print and by electronic material. For their general understanding of the course, students receive a Course Guide and a summary of the syllabus; these are updated annually. For each module, the module leader provides a Module Guide. Subject tutors provide further material as appropriate, including course notes, supporting information and reprints, problem sets, assignment briefs and experiment instructions. Students have access to books in the Perry Library, and may obtain copies of past exam papers. All guides and support are found on LSBU's Virtual Learning Environment (VLE).

Students on the course benefit from a number of contacts with industry and other outside bodies. A programme of industrial visits will be organised with the aim of introducing students to chemical industries in the UK.

All students are encouraged to take the industrial placement option. Students who complete placements have reported that the experience is invaluable in future employment. Students will find more information on placements via LSBU's Careers Hub

A sandwich placements co-ordinator in Division for Chemical and Energy Engineering will (normally) organise placement information events in-class.

The major projects taken by final year degree students have strong industrial orientation. External speakers from industry are invited to visit during the year to give students an appreciation of industrial technology and practice and, for example, the importance of HAZOP in process industry.

2.2 Student Life Support

The University's Student Life provides a wide range of personal and academic services to students and works with other departments and faculties in the University to ensure that the services offered meet the needs of students. All services, such as accommodation, enrolment practical information are based on 103 Borough Road, the main campus in Southwark. Some services are provided in the evening. Information about all services is included on the website:

https://www.lsbu.ac.uk/student-life

The services on offer include:
Skills for Learning Centre – offers students a range of interactive workshops, one-to-one tutorials and drop-in sessions delivered by experienced learning developers.
The Academic Practice and English Language team provide guidance to maximise your reading, writing and thinking and the Maths and Stats Team deliver tailored support to refresh and improve your numerical, mathematical or statistical knowledge.
https://www.lsbu.ac.uk/student-life/student-services/learning-resources

The Employability Team – helps students to access job opportunities and experience the world of work. The team support students an opportunities to undertake a work placement, internship or other professional experience or study abroad during their degree. The Employability Team deliver free employability workshops for students all year round on a variety of employment related topics.

https://www.lsbu.ac.uk/student-life/student-services/student-employability

Job Shop- is located in the LSBU Student Life Centre and covers a variety of career guidance: Tailoring CVs, cover letters and job applications, one-to-one mock interviews, temporary jobs, placement and internship opportunities and graduate roles. Also supports in sourcing relevant employability related online resources and services.

Personal development and advice – advisory service to discuss personal concerns or difficulties during their programme which might affect their personal development and academic performance, support for students with disabilities including dedicated dyslexia support, chaplaincy to provide confidential pastoral care.

Disability & Dyslexia Support (DDS) https://www.lsbu.ac.uk/student-life/student-services/disability-dyslexia-support

Health and Wellbeing Support https://www.lsbu.ac.uk/student-life/student-services/health-wellbeing

3. Quality indicators

This degree is accredited by the Institute of Chemical Engineers (IChemE) on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for registration as a Chartered Engineer.

A course board, made up of staff and student representatives from each year of the course, meets at least once per term to discuss issues to do with learning and teaching and course developments. The course board is convened and chaired by the course director.

The course is reviewed at an annual meeting of teaching staff. The review takes into account the progression statistics for the individual modules, students' end of module questionnaires and external examiners' comments. On the basis of these, modifications to modules and the course are proposed and where necessary, submitted to the School Academic Standards Committee for approval.

The course is monitored through the annual monitoring report for Chemical and Energy Engineering.

F. Entry Requirements

Foundation Year:

Entry requirements

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

BEng (Hons) Chemical and Energy Engineering

In order to be considered for entry to the programme applicants will be required to have:

- A Level BBB or;
- BTEC National Diploma DDM or;
- Access to HE qualifications with 24 Distinctions 21 Merits or;
- Equivalent level 3 qualifications worth 128 UCAS points
- Applicants must hold 5 GCSEs A-C including Maths and English or equivalent (reformed GCSEs grade 4 or above).

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

G. Course structure(s)

Course overview

Foundation Year -Full time

- The Integrated foundation year consists of 6 modules with a total value of 120 credits at level S.

All modules are compulsory. No optional modules.

	Semester 1		Semester 2	
Level S	Applied Mathematics	20 credits	Mathematics for Engineering	20 credits
	Scientific Principles for Engineering	20 credits	Engineering Science	20 credits
	Study & Laboratory Skills	20 credits	Chemistry and Applications	20 credits

BEng Chemical and Energy Engineering – Full time

- BEng (Hons) degree programmes consists of modules with a total credit value of 360 credits across levels 4, 5 and 6.
- The 360 credits consistent of 20 credit modules and a project module of 40 credits at Level 6. Each year the students need to complete 120 credits.

	Semester 1		Semester 2	
Level 4	Engineering Mathematics and Modelling		Engineering Mathematics and Modelling	20
	Design and Practice		Design and Practice	20
	Introduction to Chemical Engineering	20	Computing for Chemical Engineering	20
	Engineering Principles	20	Engineering Principles 2	20
Level 5	Advanced Eng Mathematics and Modelling		Advanced Eng Mathematics and Modelling	20
	Thermodynamics		Thermodynamics	20
	Separation Processes	20	Principles of Control	20
	Chemical Engineering Processes 1	20	Process Design and Simulation	20
Level 6	Design Project		Design Project	40
	Emerging Energy and Sustainability	20	Energy Technologies	20
	Earth Resources	20	Fluid Flow and Process Control	20

Placements information

Students can take one year place cement after completing Year 2. When placement vacancies are available, students will be notified by announcements in Moodle. The students are encouraged to find likely industrial placement by any means.

H. Course Modules and Assessment

Foundation Year

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

BEng (Hons) Chemical and Energy Engineering

Module Code	Module Title	Level	Semester	Credit value	Assessment
EEE_4_EMM	Engineering Mathematics and Modelling	4	1 & 2	20	CW & Exam
CEE_4_EP1	Engineering Principles 1	4	1	20	CW & Exam
MED_4_DAP	Design & Practice	4	1 & 2	20	CW
CEE_4_CCE	Computing for Chemical Engineering	4	2	20	CW
CEE_4_ICE	Introduction to Chemical Engineering	4	1	20	CW
CEE_4_EP2	Engineering Principles 2	4	2	20	CW & Exam
MED_5_AMM	Advanced Eng Mathematics and Modelling	5	1 & 2	20	CW & Exam
CEE_5_CEP	Chemical Engineering Processes 1	5	1	20	CW & Exam
CEE_5_SEP	Separation Processes	5	1	20	CW & Exam
CEE_5_TMD	Thermodynamics	5	1 & 2	20	CW & Exam
CEE_5_POC	Principles of Control	5	2	20	CW & Exam
CEE_5_PDS	Process Design and Simulation	5	2	20	CW
CEE_6_DES	Design Project	6	1 & 2	20	CW
CEE_6_ENT	Energy Technologies	6	2	20	CW
CEE_6_FPC	Fluid Flow and Process Control	6	2	20	CW & Exam
CEE_6_ERS	Earth Resources	6	1	20	CW & Exam
CEE_6_EES	Emerging energy and Sustainability	6	1	20	CW & Exam

I. Timetable information

Students will be able to access a full timetable for the course from the start of semester and will be notified of any changes. Maximum effort is made to leave at least one afternoon/day free from timetable.

J. Costs and financial support

Course related costs

- Although all core books can be found in the library or online as free e-books, the student may wish to buy core reading material for each module. There are also costs associated with printing during the course, which are not covered.

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
Appendix C: 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.

Foundation Year

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

BEng (Hons) Chemical and Energy Engineering

Modules			Course outcomes															
Level	**Title**	**Code**	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**D1**	**D2**	**D3**	**D4**
4	Engineering Mathematics and Modelling	EEE_4_EMM	TDA				TDA								TDA			
4	Engineering Principles 1	CEE_4_EP1	TA				TA						TDA	TA	TDA	TDA	TD	
4	Design & Practice	MED_4_DAP		TAD		TD		TDA	TDA	TDA		TDA		TDA	TDA	TDA	TDA	
4	Computing for Chemical Engineering	CEE_4_CEE	TDA				TDA				TDA				TDA	TDA		
4	Introduction to Chemical Engineering	CEE_4_ICE	TA		TA		TA	T			TA				TA	TA	TA	
4	Engineering Principles 2	CEE_4_EP2	TA				TA						TDA	TA	TDA	TDA	TDA	
5	Advanced Eng Mathematics and Modelling	MED_5_AMM	TDA				TDA				TDA				TDA			
5	Chemical Engineering Processes 1	CEE_5_CEP	TA				TA	TA							TDA	DA		
5	Separation Process	CEE_5_SEP	TA	TDA			TA	TA			TA		TA	TA		TA	TDA	
5	Thermodynamics	CEE_5_TMD	TA	T			TA	TA					TA			TA	TD	
5	Principles of Control	CEE_5_POC	TDA	TDA			TDA	TDA			TDA				TDA	TA		
5	Process Design and Simulation	CEE_5_PDS		TA	TA	TA	TA	TA	TA		TA		TA	TA		DA		
6	Design Project	CEE_6_DES		DA	DA	DA	DA	DA	DA	DA	D	TDA		DA	DA	DA	DA	D
6	Energy Technologies	CEE_6_ENT				TA				TDA		DA				DA	DA	DA
6	Emerging Energy and Sustainability	CEE_6_EES	TA		TA										DA			
6	Earth Resources	CEE_6_ERS	TDA		TDA	TDA	A	DA	TDA			TDA		TDA		D	D	
6	Fluid Flow and Process Control	CEE_6_FPC	TA	TA			TA	TA			TA			DA		DA		

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.	Design & Practice, links with IChemE, Employability Days, BCECA industrial days
Embedded learning development	<u>Support for transition and academic preparedness</u> At least two modules at level 4 should include embedded learning development in the curriculum to support student understanding of, and familiarity with, disciplinary ways of thinking and practising (e.g. analytical thinking, academic writing, critical reading, reflection). Where possible, learning development will be normally integrated into content modules rather than as standalone modules. Other level 4 modules should reference and reinforce the learning development to aid in the transfer of learning.	Design & Practice, Introduction to Chemical Engineering
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 **professionalism** and **inclusivity**. At least one module at level 4 should include an opportunity for group	Design & Practice, Design Project

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

	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.	
Curricula informed by employer and industry need / Assessment *for* learning	Authentic learning and assessment tasks 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.	Design & Practice, links with IChemE
Inclusive teaching, learning and assessment	Course content and teaching methods acknowledge the diversity of the student cohort 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.	Diversity and inclusivity is acknowledged throughout all modules
Curricula informed by	Work-based learning Opportunities for learning that is relevant to future employment or	Placement Year

employer and industry need	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.	
Embedded learning development	Writing in the disciplines: Alternative formats The development of student awareness, understanding and mastery of the specific thinking and communication practices in the discipline is fundamental to applied subject knowledge. This involves explicitly defining the features of disciplinary thinking and practices, finding opportunities to scaffold student attempts to adopt these ways of thinking and practising and providing opportunities to receive formative feedback on this. A writing in the disciplines approach recognises that writing is not a discrete representation of knowledge but integral to the process of knowing and understanding in the discipline. It is expected that assessment utilises formats that are recognisable and applicable to those working in the profession. For example, project report, presentation, poster, lab or field report, journal or professional article, position paper, case report, handbook, exhibition guide.	Design & Practice, Introduction to Chemical Engineering, Engineering Principles, Separation Processes, Thermodynamics, Chemical Engineering Process 1, Design Project
High impact pedagogies	Multi-disciplinary, interdisciplinary or interprofessional group-based learning experiences 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	Design & Practice

	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.	
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.	Variation in assessment is provided throughout all modules
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**.	Links with the IChemE, Employability Days
Curricula informed by employer and industry need / Assessment *for* learning /	<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	Design Project,

High impact pedagogies	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**.	

Appendix C: Terminology

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

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

extracurricular	activities undertaken by students outside their studies
feedback (on assessment)	advice to students following their completion of a piece of assessed or examined work
formative assessment	a type of assessment designed to help students learn more effectively, to progress in their studies and to prepare for summative assessment; formative assessment does not contribute to the final mark, grade or class of degree awarded to students

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

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