

Course Specification

| A. Course Information | | | | |
|---|---|--|----------------------------|---------------------|
| Final award title(s) | HNC Building Services Engineering Apprenticeship | | | |
| Intermediate exit award title(s) | None | | | |
| UCAS Code | | Course Code(s) | 4952 | |
| Awarding Institution | London South Bank University | | | |
| School | <input type="checkbox"/> ASC <input type="checkbox"/> ACI <input checked="" type="checkbox"/> BEA <input type="checkbox"/> BUS <input type="checkbox"/> ENG <input type="checkbox"/> IHSC <input type="checkbox"/> LSS | | | |
| Division | Civil and Building Services Engineering | | | |
| Course Director | Dr Zhihui Ye | | | |
| Delivery site(s) for course(s) | <input checked="" type="checkbox"/> Southwark <input type="checkbox"/> Havering <input type="checkbox"/> Croydon <input type="checkbox"/> Other: (please specify) | | | |
| Mode(s) of delivery | <input type="checkbox"/> Full time <input checked="" type="checkbox"/> Part time <input type="checkbox"/> Other (please specify) | | | |
| Length of course/start and finish dates | Mode | Length years | Start-month | Finish-month |
| | Part time | 2 years | September | July |
| Is this course suitable for a Visa Sponsored Student? | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Students are advised that the structure/nature of the course is not suitable for those on a Tier 4 visa, but other factors will be considered before a CAS number is allocated. | | | |
| Approval dates: | Course Validation date | | Revalidated September 2023 | |
| | Course Review date | | September 2028 | |
| | Course Specification last updated | | September 2023 | |
| Professional, Statutory & Regulatory Body accreditation | | | | |
| Link to Institute of Apprenticeship (IoA) Standard and Assessment Plan (Apprenticeship only) | https://www.instituteforapprenticeships.org/apprenticeship-standards/building-services-engineering-senior-technician-v1-1 | | | |
| Reference points | Internal | <ul style="list-style-type: none"> - Corporate Strategy 2020-2025 - Academic Quality and Enhancement Website | | |

| | | |
|--|-----------------|---|
| | | <ul style="list-style-type: none"> - LSBU Curriculum Framework - School Strategy - LSBU Academic Regulations |
| | External | <ul style="list-style-type: none"> - Engineering Council, Accreditation of Higher Education Programmes (AHEP4, Fourth Edition August 2020); - The course is informed by the CIBSE Guidelines for Developing Higher and Degree Programmes, January 2018 (Version 1 – Revision 2) - Institute for Apprenticeships and Technical Education EQA Framework, Building Services Engineering Senior Technician (HNC) Standard ST0041 - The EPAOs for EPA and On-the-Job training programme - Industrial Advisory Panel for programme support - QAA Quality Code for Higher Education 2018 - Framework for Higher Education Qualifications Subject Benchmark Statements (2015) - Framework for Higher Education (FHEQ) Outcome Qualifications Descriptions for Level 4 - Competitions and Markets Authority - Office for Students (OfS) Guidance - SEEC Level Descriptors for Higher Education 2021 - Professional Statutory and Regulatory Bodies (PSRBs) |
| | | |

| B. Course Aims and Features | |
|--|---|
| Distinctive features of this course | <p>LSBU has almost 70 years' expertise in running Building Services Engineering courses and it produces around 50% of graduates in the industry. Our HNC Building Services Engineering Apprenticeship course is designed to equip apprentices with the technical, management and communication skills needed whilst working in companies in order to be effective members of the building services engineering industry and/or its affiliated sectors with technical and application skills in accordance with the requirements of a Technician Engineer.</p> <p>This course is intended for technician apprentice engineers who are looking to develop their skills. Graduates will be well equipped to enter the industry in areas such as design and build, consultancy and facilities management.</p> <p>A wide range of building services is taught, both mechanical and electrical, and the theme of energy conservation and environmental impact is present throughout. In keeping with the needs of modern engineering practice, management and communication skills also strongly feature in this course. The course is designed to deliver the following core skills that will enable students to work effectively in the field:</p> <ul style="list-style-type: none"> • Mathematic and scientific skills and their application in building services • Technical skills and knowledge required to understand systems design • Communication skills. <p>Apprentices will also reinforce team-working skills.</p> |

| | |
|---------------------------|--|
| <p>Course Aims</p> | <p>The general aim of this course is to develop the apprentices' technical and application skills in accordance with the requirements of a Technician Engineer; the emphasis being on developing skills appropriate to a multidisciplinary, integrated building services and energy engineering environment. Technician engineers will be expected to have good technical and project management competence, with critical self-awareness and confidence in applying appropriate design solutions. They will be expected to rise up to positions of middle management. They will require good analytical and communication skills, to be able to be part of both design and on-site teams, while also being able to work independently.</p> <p>The course is specifically relevant to those wishing to join the Chartered Institution of Building Services Engineers (CIBSE) and/or the Energy Institute (EI). With regard to CIBSE the course provides the management, design and technical and practical skills for those working within the building services industry. The interests of the Energy Institute are represented by the emphasis on energy management, low energy design and an awareness of the relationship of buildings to energy resource and supply issues.</p> <p>The HNC Building Services Engineering Apprenticeship aims to:</p> <ol style="list-style-type: none"> 1. . 1. Produce Building Services/Energy Technician Apprentice Engineers educated and trained in the core discipline of Building Services/Energy Engineering with a strong emphasis on design and application. Such apprentices will already be working in the building services and energy industries, either with a consultant, end user, contractor, equipment manufacturer, energy specialist or facilities manager. 2. Develop apprentices' knowledge of mathematics, applied sciences, engineering methods, safety, economics, finance, and sustainability in support of the central themes of the course. 3. Develop apprentices' practical and problem-solving skills through the integration of a broad range of subject material. 4. Teach apprentices to communicate clearly, to argue rationally and to draw conclusions based on a rigorous, analytical and critical approach to data and systems. 5. Develop the transferable skills expected of a Building Services/Energy Technician Apprentices Engineers who are working in multidisciplinary teams with technical, commercial and management staff in industrial and other occupations. 6. Produce Building Services/Energy Technician Apprentice Engineers capable of contributing to the profession of Energy/Building Services Engineering in the context of modern industrial practice and sustainable development by promoting advanced techniques and methods and by extending current technologies. 7. Produce Building Services/Energy Technician Apprentice Engineers who will have the core competencies and enthusiasm to continue lifelong learning and development. |
|---------------------------|--|

| | |
|--|--|
| <p>Course Learning Outcomes</p> | <p>The course outcomes have been developed concerning the Engineering Council's Accreditation of Higher Engineering Academic Programmes, Fourth Edition (August 2020). The codes in brackets (F1 to F18) refer to the AHEP4 and are mapped with the Learning Outcomes described in the AHEP4 documentation.</p> <p>The curriculum map showing the modules in which the material that each of the learning outcomes covers is taught, developed, and assessed is in Appendix A.</p> <p>F1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems.</p> |
|--|--|

F2 Analyse broadly-defined problems reaching substantiated conclusions.

F3 Use appropriate computational and analytical techniques to model broadly-defined problems.

F4 Select and use technical literature and other sources of information to address broadly defined problems.

F5 Design solutions for broadly defined problems that meet a combination of user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal and environmental matters, codes of practice and industry standards.

F6 Apply a systematic approach to the solution of broadly-defined problems.

F7 Evaluate the environmental and societal impact of solutions to broadly-defined problems.

F8 Identify ethical concerns and make reasoned ethical choices informed by professional codes of conduct.

F9 Identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.

F10 Adopt a holistic and proportionate approach to the mitigation of security risks.

F11 Recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.

F12 Use practical laboratory and workshop skills to investigate broadly defined problems.

F13 Select and apply appropriate materials, equipment, engineering technologies and processes.

F14 Recognise the need for quality management systems and continuous improvement in the context of broadly defined problems.

F15 Apply knowledge of engineering management principles, commercial context and project management.

F16 Function effectively as an individual, and as a member or leader of a team.

F17 Communicate effectively with technical and non-technical audiences.

F18 Plan and record self-learning and development as the foundation for lifelong learning/CPD.

The course also contributes to the fulfilment of the occupational profile of the Building Services Engineering Senior Technician (HNC) Standard ST0041

specified by the following Knowledge, Skills and Behaviours (KSBs). This KSBs are mapped against the learning outcomes (Appendix A)

Apprenticeship Standards

Knowledge

K1 Engineering principles, underpinned by relevant scientific, theoretical and technical knowledge and understanding to solve well-defined building services engineering problems.

K2 Building services engineering techniques, procedures and methods used for building services engineering systems, to either measure and test, design, install, commission, maintain or operate.

K3 Advanced mathematical, statistical and analytical problem-solving tools

K4 Properties of, and selection criteria for materials, components or parts used in building services engineering solutions.

K5 Techniques and methods to collect data and technical information, to analyse and evaluate building services engineering problems.

K6 Design principles and control processes used in the building services engineering consultancy, construction or manufacturing process, and the common constraints faced.

K7 Technical drawings, designs, and models, using analytical and computer-based software packages.

K8 Uses and limitations of computational and digital models, including Building Information Modelling (BIM)

K9 Industry policies, standards, regulations and legislation, and codes of practice, including Building Safety legislation, or BSI Flex 8670

K10 Statutory health, safety and welfare policies, procedures, and regulations including the Construction (Design and Management) regulation.

K11 Risk assessment and mitigation processes, and their importance in the building services environment

K12 Principles of sustainable development and their impact on the lifecycle of building services engineering solutions, including United Nations Sustainable Development Goals (UNSDG), net zero carbon emissions, environmental policies and legislations, and the climate change act

K13 Project management techniques, including quality and information management and assurance systems and continuous improvement processes.

K14 Methods for planning and resourcing building services engineering tasks, and the impact on cost, quality, safety, security, and environment

K15 Methods of communication and when to use them, using appropriate engineering terminology and conventions.

K16 Roles and responsibilities within the organisation, team dynamics and their own boundaries of authority

K17 Relationships between key organisations in the building services engineering sector (for example organisations, customers, partners, and suppliers)

K18 Equality, diversity and inclusion, its importance and impact on building services engineering solutions

K19 Ethical principles as applied to building services engineering including the need for security of data and information.

K20 Methods to maintain professional competence and technical knowledge including initial professional development (IPD) and continuing professional development (CPD)

Skills

S1 Apply engineering principles, using relevant scientific, theoretical and technical know-how to solve well-defined building services engineering problems.

S2 Apply building services engineering techniques, procedures, and methods, and review the results, when measuring and testing, designing, installing, commissioning, maintaining or operating building services engineering systems

S3 Employ a range of advanced mathematical, statistical and data interpretation tools, using analytical and computational methods to interpret and solve well-defined building services engineering problems.

S4 Interpret and compare performance information to choose compliant materials, components, or parts.

S5 Select and use technical literature and other sources of information and data to address well defined building services engineering problems.

S6 Produce and interpret building services engineering technical drawings, designs, and models, using analytical and computer-based software packages, recognising the limitations of the software used.

S7 Produce building services engineering technical solutions in accordance with relevant industry standards, procedures, codes of practice, regulations, and legislation.

S8 Comply with, and encourage others to demonstrate, statutory health, safety and welfare policies, procedures, and regulation.

S9 Complete risk assessments to identify, evaluate and mitigate risks.

S10 Apply principles of sustainable development and assess the impact of these in their work.

S11 Employ project management techniques, measuring and recording progress against building services engineering project plans.

S12 Assess and report on quality using appropriate management and assurance systems and continuous improvement processes

S13 Identify and use resources, equipment, and technology to meet project requirements, including specifications, budget and timescales.

S14 Monitor and manage individual performance, and supervise others, recognising the need to comply with appropriate codes of practice and equality, diversity & inclusion (EDI) requirements.

S15 Communicate using appropriate methods for the audience, using appropriate engineering terminology and conventions.

S16 Apply ethical principles to building services engineering projects, including the secure use of data and information.

S17 Plan, undertake and review their own professional competence, updating and reviewing their CPD to improve performance.

Behaviours

B1 Works to health, safety and welfare requirements, industry standards, statutory regulation and legislation, policies, and codes of practice, and ensuring others do likewise.

B2 Makes independent decisions when delivering building services engineering projects, whilst knowing their own limitations and when to ask for help or to escalate.

B3 Works individually and as part of a team, being aware of their actions and the impact they may have on others and demonstrating awareness of diversity and inclusion issues so as to meet the requirement of fairness at work.

B4 Solves problems with attention to detail, accuracy, and diligence, and seeks to continually improve.

B5 Maintains professional and ethical working relationships with internal, external, and other stakeholders.

B6 Takes responsibility for their own professional development, seeking opportunities to enhance their knowledge, skills, and experience, and support others when requested

C. Teaching Learning and Assessment Strategy

This course is taught by delivering lectures, tutorials, individual and group works, laboratories, computer laboratories, and any other activity the module leaders consider relevant and useful for student learning.

LSBU provide access to laboratories, computer rooms, a library, equipment, and many other resources that can be found by visiting the Student Life Centre or talking to the academics and personal tutors. Information about resources can also be found on [Home Page - London South Bank University \(lsbu.ac.uk\)](https://www.lsbu.ac.uk). Further, student can contact staff via Salesforce and the student services via [MyAccount](#). In the case of MyAccount, students can do live Chat from the bottom right corner to get a prompt response. Students are supported throughout this strategy and the activities involved primarily through SAL and MyAccount as the default, with additional support offered via our VLE moodle, Microsoft Teams, emails, and direct face-to-face meetings.

Every academic provides surgery hours (in person and/or on Teams) and can be contacted by email, Teams messages and in person during the classes.

When necessary, due to professional, personal, health or other circumstances, hourly paid lecturers, PhD students, or any other qualified person can cover part of the lectures and activities of this course. They will be always supervised by academics covering the role of module leaders and course directors.

This course is delivered by a blended approach. This means the material and the delivery of the teaching include physical notes in many cases but electronic notes, recorded videos, and multimedia as well. All of this is offered to boost the learning process of students.

However, this course involves an understanding of concepts, attempting all the tutorial questions, watching videos, and reading articles and books. To succeed in this course, the student must invest a minimum private study time of 1,200 hours approx. This time, of course, is variable depending on the previous knowledge of the student (background).

The effort must be continuous and steady throughout the academic year.

In the next paragraphs, a detailed teaching strategy is provided in connection with the modules and learning outcomes established previously and in appendices A and B.

The codes in brackets (**F1 to F18**) refer to the Learning Outcomes described in the AHEP4 documentation.

The codes in brackets (**K1 to K20; S1 to S17; B1 to B6**) refer to the occupational standard ST0041.

Apprentices will apply a systematic approach to the solution of broadly defined problems (**F6; K7;S7**) in **Heating and Ventilation Design, Electrical Principles and Thermofluids Principles**. They will appraise and question the purpose of a given heating system design brief of heat loss analysis, heating system choice and control, and consider its broad environmental implications. They will develop a holistic approach to heating system design.

They will identify ethical concerns and make reasoned ethical choices informed by professional codes of conduct (**F8; K19; S16; B5**) in **Construction Practice B**. They will appreciate the significance to society of the impact of human activity on the environment. They will formulate and articulate judgements relating to ethical behaviour. They will identify the ethical elements in decision-making. They will understand the interaction between engineering, the environment, and society, and the implications of their professional engineering institution's code of professional conduct.

Apprentices will apply knowledge of mathematics, statistics, natural science and engineering principles (**F1; K3; S1; S3**) and will analyse broadly defined problems reaching substantiated conclusions (**F2; K3; S3**) in **Foundation Engineering Mathematics, Engineering Mathematics B, Electrical Principles and**

Thermofluids Principles. At some extent, they will show awareness the challenges of global warning impact on building services industry.

Apprentices will apply design solutions for broadly defined problems that meet a combination of user, business, and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, and environmental matters, codes of practice and industry standards **(F5; K6; K7; K9; K10; S6; S7)** in **Construction Practice B** and **Internal Environment and Comfort B**. They will demonstrate, through group design work and presentations, a strong awareness of, and commitment to, the principles of regenerative design, intervention which has societal benefit, and sustainable development. They will appreciate the perspectives of all 'stakeholders', ensuring that designs are inclusive of all users. They will show they say creative skills through design projects.

Apprentices will evaluate the environmental and societal impact of solutions to broadly defined problems **(F7; K12; S10)** in **Fundamentals of Building Services Engineering as well as Heating and Ventilation Design**. They will gather, assimilate, and apply relevant knowledge and information to building services engineering, energy, and environmental issues with regards to various building services systems for the support of the project. They will be aware of resource scarcity, embodied energy, and low energy building services system choice and design. Through the coursework and class activities, they will demonstrate their understanding of the principles in tackling issues related to climate changes, as well as low energy low carbon emission building and building services system design.

Apprentices will communicate effectively with technical and non-technical audiences **(F17; K15; K17; S15; B5)** in **Foundation Engineering Mathematics** and **Engineering Mathematics B**. They will explain clearly and knowledgeably about solve complex engineering issues via coursework, lab reports and exam. They will demonstrate clear communication skills through their report writing, experimental testing, and sustainability matters.

Apprentices will use practical laboratory and workshop skills to investigate broadly defined problems **(F12; S12; B3)** in **Internal Environment & Comfort B**. They will demonstrate knowledge of thermal, lighting and acoustics impact on human comfort mainly in lab reports, coursework, and exam.

Apprentices will recognise the responsibilities, benefits and importance of supporting equality, diversity, and inclusion **(F11; K18; S14; B3)** in **Construction Practice B**. They will demonstrate team working skills and awareness of inclusive behaviours through design projects and other activities.

Apprentices will recognise the need for quality management systems and continuous improvement in the context of broadly defined problems **(F14; K13; S8; B1; B4)** in **Internal Environment & Comfort B**. They will demonstrate how the design method, issues of safety and legislation, and the concepts of quality assurance can strongly influence internal environment design choices. Also, they will identify and assess risks throughout the design process and decide on methods of elimination and/or control under quality assurance.

Apprentices will select and apply appropriate materials, equipment, engineering technologies and processes **(F13; K4; S4; S13)** in **Fundamentals of Building Services Engineering as well as Heating and Ventilation Design**. They will consider the global warning and energy issues when select material, equipment, engineering technologies and processes. They will know how wasteful or not a good design is when rated against carbon footprint and societal benefit.

Apprentices will adopt a holistic and proportionate approach to the mitigation of security risks **(F10; K19; S16)** in **Construction Practice B**. They will demonstrate an increasing awareness, and development of the treatment of data, IP and confidentiality. They will understand how risks can be mitigated and the importance of communicating risks to others.

Apprentices will function effectively as an individual, and as a member or leader of a team **(F16; K16; S14)** in **Internal Environment & Comfort B**. They will demonstrate both individual and team working creative skills through lab works and group coursework. They will conduct themselves appropriately when undertaking lab works demonstrating the importance of honesty, integrity and an ethics-driven thinking.

Apprentices will apply knowledge of engineering management principles, commercial context, and project management (**F15; K13; K14; S11**) in **Construction Practice B**. They will be aware of how the economy, sustainability, ethics, politics, and the impact on all members of society can affect design and construction. They will justify the chosen solution (including in a non-technical language) to 'stakeholders'. They will interact with 'stakeholders' to help the 'client' and other team members to develop a better understanding of the brief, including the functional, social, and economic objectives. They will be aware of the use of environmental management systems, environmental impact assessment, and social impact assessment and how they are used in engineering projects.

Apprentices will select and use technical literature and other sources of information to address broadly defined problems (**F4; K5; S5**) in **Fundamentals of Building Services Engineering, Electrical Principles and Thermofluids Principles**. They will be able to use technical literature related to the building services discipline to find out the current innovated technology and avoid engineering failure.

Apprentices will plan and record self-learning and development as the foundation for lifelong learning/CPD (**F18; K20; S17; B2; B6**) in **Construction Practice B**. They will appreciate the need for continuing professional development developing and open safety culture which encourages challenge. They will learn independently, understanding the limits of their technical competency in recognising complexity in problems and developing critical thinking skills and professional judgements.

They will identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity (**F9; K11; S9**) in **Heating and Ventilation Design**. They will understand and identify the concepts of hazard and risk, estimating prioritising and mitigating risks. They will assess and mitigate environmental risk in designing heating and ventilation system.

Apprentices will use appropriate computational and analytical techniques to model broadly defined problems (**F3; K2; K8; S2; S6**) in **Heating and Ventilation Design**. They will analysis data and consider engineering constrain to drive their engineering thinking and will conduct project design decision.

Self-study is an integral part of this course and for most of the modules, students are expected to complete 152 hours of self-study for each module. This does not include contact time in lectures, tutorials and labs which is 48 hours for most of the modules.

The library has a number of in-line resources to help students including:

- IHS
- British Standards
- Access to numerous building services magazines.

Staff teaching on the course are LSBU Civil and Building Services Engineering Division staff.

D. Assessment Methods

General definitions

The assessment in this course is made by coursework (CW) and exams (EX).

CW can be in the form of tests, reports, quizzes, etc. (individual or in groups; on-campus and/or online via Moodle).

Exams are individual assessments and can be in the form of on-campus written exercises or online.

There are modules which are CW 100%, there are others with different weights on CW and exams. CW can have several components.

The modality is defined module by module in the module guides.

Details about weights can be found at **H. Course Modules** in these specifications.

This course, through its modules, includes summative and formative assessments for students to prepare for their exams.

Summative assessments are the assessments that define the student's official marks on coursework and exams.

A formative assessment is like a summative assessment, but the marks obtained (if any) are not part of the official assessment. These marks are just a tool for the student to test themselves. A formative assessment can be a previous year's coursework or exam paper, an original coursework or an original exam paper, quizzes, tests, etc. This will be decided and designed by the module leader.

Summative assessments can be reviewed and clarified after the students' requirements by the academic judgment will prevail (principle of academic judgment independence). When students are dissatisfied with their marks, they have an official appeal process to follow.

E. Academic Regulations

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

<https://www.lsbu.ac.uk/about-us/policies-regulations-procedures>

There are some extra regulations defined by the requirements by CIBSE and EI that in some cases can be more restrictive than the LSBU regulations. They are stated in these specifications and the course guide.

Condonement

No Condonement of modules is allowed in this course.

F. Entry Requirements

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

- A Level EEE - Must include Mathematics and preferably a Science in either Chemistry or Physics (UCAS points: 48)
- T-level (Pass or above) in Construction: Design, Surveying and Planning. (UCAS points: 72)
- BTEC Level 3 Extended Diploma MPP in an Engineering subject area or Construction and Built Environment area (Must include Mathematics and advanced Mathematics) (UCAS points: 64)
- Civil Engineering Technician level 3 apprenticeship MP (UCAS points: 48) alongside grade Pass or Distinction at EPA
- Access to HE qualifications with 45 Passes supported by substantial relevant work experience
- Other equivalent level 3 qualifications worth 64 UCAS points supported by substantial relevant work experience
- Applicants must hold 5 GCSEs A-C including Maths and English or equivalent (reformed GCSEs grade 4 or above).

Credit for prior learning (APL)

Applicants may be able to use their learning or other life experiences to gain academic credit towards their course of study. Applicants need to demonstrate that their learning is equivalent to formal learning on the course and produce satisfactory evidence. If an applicant has gained a qualification from a professional body or another institution this may be credited towards the University qualification via our transfer credit scheme.

G. Course Structure(s)

Course overview

Building Services Engineering at London South Bank University is studied at undergraduate level at HND and BEng (Hons) levels. The HNC apprenticeship has been deliberately designed to share modules at levels 4 to facilitate cross transition 'ladders and bridges' between the courses of HNC and BEng and opportunities are taken to lecture HNC and BEng students together where appropriate.

Professional recognition is an important, if not essential, attribute of the course. This is governed by the Engineering Council AHEP for Engineering Technician (Eng Tech) and further progression to Incorporated Engineer (IEng).

Level 4 modules contain a broad mixture of mechanical and electrical services together with management and supporting maths and science. Details of module content may be derived from individual module guides.

Part-time study

Year 1

Foundation Engineering Mathematics (Level S)

Electrical principles (Level 4)

Fundamentals of building Services Engineering (Level 4)

Thermofluids Principles (Level 4)

Year 2

Engineering Mathematics B (Level 4)

Construction Practice B (Level 4)

Internal Environment and Comfort B (Level 4)

Heating and Ventilation Design (Level 4)

Students have the benefit to reinforce their knowledge through a level S Mathematics modules and an extra module of Level 4. They can take advantage of these modules for fulfilment of their portfolios.

| | Semester 1 | | Semester 2 | | credits |
|---------------------------------|---|----|--------------------------------|----|---------|
| | credits | | | | |
| Year 1 | Foundation Engineering Mathematics (Level S) | 20 | | | |
| | | | Electrical principles | 20 | |
| | Fundamentals of building Services Engineering | 20 | | | |
| | | | Thermofluids Principles | 20 | |
| | Gateway Preparation (0 Credit) | | | | |
| Year 2 | Construction Practice B | | Construction Practice B | 20 | |
| | Engineering Mathematics B | | Engineering Mathematics B | 20 | |
| | Internal Environment and Comfort B | 20 | | | |
| | | | Heating and Ventilation Design | 20 | |
| | Gateway Preparation (0 Credit) | | | | |
| End Point Assessment (0 Credit) | | | | | |

Placements information

N/A

H. Course Modules

| Module Code | Module Title | Level | Credit value | Semester | Assessment Ex/CW |
|-------------|---|-------|--------------|----------|------------------|
| BEA-S-459 | Foundation Engineering Mathematics | S | 20 | 1 | 100/0 |
| BEA_4_EMB | Engineering Mathematics B | 4 | 20 | 1-2 | 50/50 |
| BEA-4-452 | Electrical Principles | 4 | 20 | 2 | 100/0 |
| BEA-4-453 | Thermofluids Principles | 4 | 20 | 2 | 100/0 |
| BEA-4-485 | Construction Practice B | 4 | 20 | 1-2 | 0/100 |
| BEA_4_FBE | Fundamentals of building Services Engineering | 4 | 20 | 1 | 0/100 |
| BEA_4_ICB | Internal Environment and Comfort B | 4 | 20 | 1 | 50/50 |
| BEA_4_HVD | Heating and Ventilation Design | 4 | 20 | 2 | 0/100 |
| CBE_4_GW1 | Gateway Preparation | 4 | 0 | 1-2 | N/A |
| CBE_4_GW2 | Gateway Preparation | 4 | 0 | 1-2 | N/A |
| CBE_4_EPA | End Point Assessment | 4 | 0 | 1-2 | N/A |

I. Timetable information

The course will run one day per week for two years. Timetables will be made available to students when they register.

Once students are fully enrolled, they will have access to the Moodle Site, MS Teams and the official timetable via MyAccount. This is usually available in the second half of September.

Apart from the teaching timetable, there are other activities offered to the student by several other teams. Sporting, cultural, and other activities that are not mandatory must be managed by the students themselves.

Students will be notified by email of any changes to the timetable.

J. Costs and financial support**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/study/undergraduate/fees-and-funding> or <http://www.lsbu.ac.uk/study/postgraduate/fees-and-funding> <https://www.lsbu.ac.uk/international/fees-and-funding>

Information on living costs and accommodation can be found by clicking the following link: <https://www.lsbu.ac.uk/student-life/our-campuses/southwark/cost-of-living>

List of Appendices

Appendix A: Curriculum Map

Appendix B: Terminology

Appendix C: The Apprenticeship Standard

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, and external examining processes. Making the learning outcomes explicit will also help students to monitor their own learning and development as the course progresses. (T: Taught; D: Developed; A: Summative Assessment)

| YEAR | Modules | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 | F11 | F12 | F13 | F14 | F15 | F16 | F17 | F18 |
|--------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| YEAR 1 | Foundation Engineering Maths (LS) | TDA | | | | | | | | | | | | | | | | TDA | |
| | Fundamentals of Building Services (L4) | | | | TDA | | | TDA | | | | | | TDA | | | | | |
| | Electrical Principles (L4) | TDA | TDA | | TDA | | TDA | | | | | | | | | | | | |
| | Thermofluids Principles (L4) | TDA | TDA | | TDA | | TDA | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| YEAR 2 | Heating & Ventilation Design (L4) | | | TDA | | | TDA | TDA | | TDA | | | | TDA | | | | | |
| | Construction Practice B (L4) | | | | | TDA | | | TDA | | TDA | TDA | | | | TDA | | | TDA |
| | Engineering Mathematics B (L4) | TDA | | | | | | | | | | | | | | | | TDA | |
| | Internal Environment & Comfort B (L4) | | | | | TDA | | | | | | | TDA | | TDA | | TDA | | |

(a: formative assessment to contribute to the fulfilment of the occupational standard. The summative assessment is undertaken by the EPAO during the EPA process)

| K S B | Learning Outcomes AHEP4 | | | | | | | | | | | | | | | | | | |
|-----------|-------------------------|----------------------|---------------------------------|----|----|-----------------------|-----------------------------|--------------------------|--------|------|----------|-----|-------------------------------|-----------------------------------|--------------------|------------------------------------|----------|---------------|-------------------|
| | Science and mathematics | Engineering Analysis | | | | Design and Innovation | | The engineer and society | | | | | Engineering practice | | | | | | |
| | | Problem Analysis | Analytical tools and Techniques | | | Design and Innovation | Integrated/Systems Approach | Sustainability | Ethics | Risk | Security | EDI | Practical and Workshop Skills | Material, Equipment, Technologies | Quality Management | Engineering and Project Management | Teamwork | Communication | Lifelong Learning |
| | | | F1 | F2 | F3 | | | | | | | | | | | | | | |
| Knowledge | | | | | | | | | | | | | | | | | | | |
| K1 | a | | | | | | | | | | | | | | | | | | |
| K2 | | | a | | | | | | | | | | | | | | | | |
| K3 | a | a | | | | | | | | | | | | | | | | | |
| K4 | | | | | | | | | | | | | a | | | | | | |
| K5 | | | | a | | | | | | | | | | | | | | | |
| K6 | | | | | a | | | | | | | | | | | | | | |
| K7 | | | | | a | a | | | | | | | | | | | | | |
| K8 | | | a | | | | | | | | | | | | | | | | |
| K9 | | | | | a | | | | | | | | | | | | | | |
| K10 | | | | | a | | | | | | | | | | | | | | |
| K11 | | | | | | | | | a | | | | | | | | | | |
| K12 | | | | | | | a | | | | | | | | | | | | |
| K13 | | | | | | | | | | | | | | a | a | | | | |
| K14 | | | | | | | | | | | | | | | a | | | | |
| K15 | | | | | | | | | | | | | | | | | a | | |
| K16 | | | | | | | | | | | | | | | | a | | | |
| K17 | | | | | | | | | | | | | | | | | a | | |
| K18 | | | | | | | | | | | a | | | | | | | | |
| K19 | | | | | | | | a | a | | | | | | | | | | |
| K20 | | | | | | | | | | | | | | | | | | a | |

APPRENTICESHIP STANDARD

| | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 | F11 | F12 | F13 | F14 | F15 | F16 | F17 | F18 |
|------------------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Skills | | | | | | | | | | | | | | | | | | |
| S1 | a | | | | | | | | | | | | | | | | | |
| S2 | | | a | | | | | | | | | | | | | | | |
| S3 | a | a | | | | | | | | | | | | | | | | |
| S4 | | | | | | | | | | | | | a | | | | | |
| S5 | | | | a | | | | | | | | | | | | | | |
| S6 | | | a | | a | | | | | | | | | | | | | |
| S7 | | | | | a | a | | | | | | | | | | | | |
| S8 | | | | | | | | | | | | | | a | | | | |
| S9 | | | | | | | | | a | | | | | | | | | |
| S10 | | | | | | | a | | | | | | | | | | | |
| S11 | | | | | | | | | | | | | | | a | | | |
| S12 | | | | | | | | | | | | a | | a | | | | |
| S13 | | | | | | | | | | | | | a | | | | | |
| S14 | | | | | | | | | | | a | | | | | a | | |
| S15 | | | | | | | | | | | | | | | | | a | |
| S16 | | | | | | | | a | | a | | | | | | | | |
| S17 | | | | | | | | | | | | | | | | | | a |
| | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 | F11 | F12 | F13 | F14 | F15 | F16 | F17 | F18 |
| Behaviour | | | | | | | | | | | | | | | | | | |
| B1 | | | | | | | | | | | | | | a | | | | |
| B2 | | | | | | | | | | | | | | | | | | a |
| B3 | | | | | | | | | | | a | a | | | | | | |
| B4 | | a | | | | | | | | | | | | a | | | | |
| B5 | | | | | | | | a | | | | | | | | | a | |
| B6 | | | | | | | | | | | | | | | | | | a |

Appendix B: Terminology

(Please review the definitions and add those according to your course and context to help prospective students who may not be familiar with terms used in higher education.)

Some examples are listed below:

| | |
|---------------------------------|---|
| accelerated degree | accelerated degrees (also known as two-year degrees) are full bachelor's degrees (undergraduate courses) you can complete in a condensed time. |
| 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 |
| end-point assessment | End-point assessment (EPA) tests the knowledge, skills and behaviours that an apprentice has gained during their training. Unique to each standard, EPA demonstrates the competence of an apprentice in their role. Only approved End-Point Assessor Organisations (EPAOs) can carry out assessments as set out in the assessment plan. |
| extended degree | an extended degree provides a bridging route for students who don't meet the initial entry requirements for the undergraduate degree. The first year provides the necessary knowledge and skills before students begin the degree-level course. |
| extracurricular | Activities are 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, progress in their studies and prepare for summative assessment; formative assessment does not contribute to the final mark, grade or class of degree awarded to students |

| | |
|-------------------------------------|--|
| foundation | foundation year programmes are designed to develop skills and subject-specific knowledge to ensure a student can advance to a degree course. They may be offered as stand-alone one-year courses or integrated into degree programmes. |
| gateway | gateway takes place before an End-Point Assessment (EPA) can start. The employer and LSBU will review their apprentice's knowledge, skills and behaviours to see if they have met the minimum requirements of the apprenticeship set out in the apprenticeship standard and are ready to take the assessment. Usually includes off-the-job training and reviews. |
| 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 |
| integrated | an integrated master's degree combines undergraduate and postgraduate study. About Apprenticeships, integrated would usually mean that the End-Point Assessment (EPA) is integrated with the academic award |
| intensity of study | the time taken to complete a part-time course compared to the equivalent full-time version: for example, the 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 |
| material information | information students need to make an informed decision, such as what and where to study |
| mode of study | different ways of studying, such as full-time, part-time, e-learning or work-based learning |
| 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 '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 |
| non-integrated | about Apprenticeships, non-integrated would usually mean that the End-Point Assessment (EPA) is not integrated with the academic award |
| 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 |
| pre-registration (HSC only) | a pre-registration course is designed for students who are not already registered with an independent regulator such as the Nursing and Midwifery Council (NMC) |

| | |
|---|---|
| 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 / regulatory body | a course that is regulated by a regulatory body, which is an organisation recognised by the 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 | A formal assessment of students' work, contributes to the final result. |
| term | any of the parts of an academic year that are divided into three or more for purposes of teaching and assessment (in contrast to division into semesters) |
| top-up degree | A top-up degree is the final year (Level 6) of an undergraduate degree course. It allows students to top-up an existing qualification to a full BA, BSc, or BEng. |
| total study time/workload | 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 skills, knowledge or understanding as part of their course |
| written examination | a question or set of questions relating to an area of study to which candidates write answers usually (but not always) under timed conditions |

Appendix C: The Apprenticeship Standard

An apprenticeship is aligned to a standard which is referred to as an ‘apprenticeship standard’. An apprenticeship standard is designed by groups of employers known as ‘trailblazer groups’ to meet skill shortages in their sectors and is linked to an occupational profile. Apprenticeship standards are designed by industry and lay out which Knowledge, Skills and Behaviours (KSBs) must be mastered by the Apprentice by the end of apprenticeship programme in order to successfully achieve the apprenticeship qualification. Note that this degree programme is non-integrated.

The academic element of the apprenticeship programme is mapped to the apprenticeship standard. A list of KSBs that must be evident in addition to the degree programme. LSBU e-portfolio system will allow Apprentice to set tasks to address any outstanding elements of the Standard and to ensure that the progress is tracked regularly. Evidence for the Skills and Behaviours should be collected and stored on LSBU e-portfolio. For example: A Witness Testimony, from your employer, detailing a task that you have undertaken whilst at work, which meets a criterion of the Standard.

Completing the academic element only partly satisfy the requirements of the Apprenticeship Standard, there are also skills and behaviours that need to be addressed at the workplace. Details of your Standard can be located on the Institute of Apprentices website and via your LSBU e-portfolio.

Link to Institute for Apprenticeships & Technical Education (IfATE) Standard and Assessment Plan:

<https://www.instituteforapprenticeships.org/apprenticeship-standards/building-services-engineering-senior-technician-v1-1>

20% off-the-job Training

Apprentices are required to spend 20% of the contracted hours on off-the-job activities that directly relate to your apprenticeship. It is the responsibility for the Apprentice and the employer to create a working plan to show 20% off-the-job training.

ESFA Definition

“Off-the-job training is defined as learning which is undertaken outside of the normal day-to-day working environment and leads towards the achievement of an apprenticeship. This can include training that is delivered at the apprentice’s normal place of work but must not be delivered as part of their normal working duties.”

| Off-the-job training can include: | Off-the-job training does not include: |
|---|---|
| The teaching of theory (for example: lectures, role playing, simulation exercises, online learning or manufacturer training) | Preparing for Functional Skills English and Maths (If applicable) |
| Practical training (for example: Shadowing, job rotation, industry visits and attendance at competitions) | Progress Reviews |
| Group discussions & Tutorials | On-programme assessment required for the apprenticeship standard |
| Learning Support (If applicable) | Training which takes place outside of your paid working hours |
| Time spent writing assessments / assignments | Induction into university or work place |

The 20% off-the-job activity cannot be part of the normal work, however, the employer can utilise some of this 20% by undertaking projects within the organisation, so long as it would not be part of normal role. The 20% hours must be logged on LSBU e-portfolio to provide evidence, which will be used in the progress reviews and End Point Assessment. It's important to note that an apprenticeship is not solely an academic programme; the academic programme and corresponding qualification is just one element of an apprenticeship. There are different and additional commitments and expectations required of both the apprentice and the employer.

Apprenticeship Progress Reviews (APRs)

It is important that the progress are made and tracked throughout the course and it is written on record. Progress reviews are conducted at the end of each semester between LSBU, the apprentice and the employer via meetings or conference call and LSBU e-portfolio. The attendance and results will be uploaded when the review is due for employer to access.

THE FULFILLMENT OF THE KNOWLEDGE, SKILLS AND BEHAVIOURS WILL BE ACHIEVED WITH THE COLLABORATION OF THE EPAO UNDER THEIR ON PROGRAMME ASSESSMENT AND END-POINT ASSESSMENT.

Gateway Preparation Module

The Gateway is the entry point to End-Point Assessment (EPA). It is the point at which the apprentice has completed their learning, met the requirements of the standard, 20% off-the-job (OJT) training, and that they, alongside their employer and LSBU agree that they are ready to enter their EPA.

The Gateway Preparation module is a pass/fail, zero credit module designed to support apprentices to identify and work towards meeting the Gateway criteria from an early stage in their apprenticeship, particularly those that sit outside of an academic qualification. The module will be completed each year throughout the duration of the apprenticeship up to passing the Gateway.

The Gateway

LSBU will be required to submit evidence of the following to progress onto the final stages of the EPA, this will include:

- English & Maths
- Degree
- 20% off the job training requirement met
- Academic qualification

End-Point Assessment (EPA) (Completion) Module End-point assessment (EPA) is the final stage of an apprenticeship and must be completed after the apprentice successfully passes through Gateway. It is an assessment of whether the apprentice has developed the skills, knowledge and behaviours outlined in the apprenticeship standard.

The End Point Assessment (Confirmation) module is a pass/fail independent summative assessment carried by the End Point Assessment Organisation (EPAO) that facilitates achievement and progress of the non-integrated End Point Assessment. It is assessed and confirmed by the EPAO as set out in the assessment plan for the standard. The grade is confirmed by the EPAO.

End Point Assessment

To successfully complete your apprenticeship, you will need to achieve in the End Point Assessment (EPA), during which your competence of the KSBs, as set out in the apprenticeship standard, is assessed. The EPA plan is a document which was created by the trailblazer group

which sets out the requirements, assessment methods and grading criteria for the EPA. All current apprenticeship standards and assessment plans can be found on the Institute for Apprenticeships website. There is a certain period once you have completed the degree to complete the EPA.

To know about the EPA assessment plan, please refer to the link provided.

For further details, please refer to the Apprentice Team at apprenticeships@lsbu.ac.uk.