PROGRAMME SPECIFICATION

Higher National Certificate in Building Services Engineering

Awarding institution	Liverpool John Moores University
Teaching institution	LIVERPOOL COMMUNITY COLLEGE
JACS Code	K200
Programme Duration	
Language of Programme	All LJMU programmes are delivered and assessed in English
Subject benchmark statement	Engineering
Programme accredited by	
Description of accreditation	
Validated target and alternative exit awards	Higher National Certificate in Building Services Engineering
Link Tutor	Stephen Wynn

Educational aims of the programme

The overall aim of the programme is to develop knowledge, understanding and intellectual and practical skills appropriate to a variety of roles within the building engineering services sector. As the programme will address both engineering design and commercial project management practices it is suited to those engaged in the building services engineering in either of these capacities. It is also well suited to people in other sectors of the built environment who are required to interface with the building services engineering sector i.e. facilities management, etc.

The intention is to provide a stimulating and challenging programme of study that accurately reflects the activities on the building services engineering industry and prepares students for effective, productive and responsible employment in the sector.

The programme will offer the appropriate type and level of support as students build their knowledge,

understanding and skills to become independent learners for the future. The programme will offer opportunities for students to exercise some choice as to what they study in relation to their own or their companies' career aspirations.

The specific aims of the programme are:

To provide a progressive and coherent route that enables students to develop the specialist skills, knowledge and understanding necessary a range of technical, professional, managerial and supervisory roles associated with the Building Services Engineering industry.

To enable student engineers to develop a range of skills, techniques, personal qualities and attitudes essential for them to make an immediate contribution to their existing or prospective employment within the Building Services Engineering sector.

To provide students with the flexibility, knowledge, motivation, transferable skills and intellectual awareness to enable and encourage them to progress to further HE study and/or participate in lifelong learning and continuous professional development.

To provide a programme of study and assessment strategy that recognises and builds on existing skills and work based experiences and develops understanding through both academic studies and work based experiences as both individuals and within project teams.

To develop personal qualities including an understanding of ethical responsibilities and positive social attitudes, which are essential for success in the construction industry.

To develop the active participation of employers and industry representatives in the development, planning, review and assessment of the programme.

To maintain a close working relationship with Professional Bodies and the building services industry at large.

Target award Learning Outcomes - Higher National Certificate

A student successfully completing the programme of study will have acquired subject knowledge and understanding as well as skills and other attributes.

Knowledge and understanding

A student who is eligible for this award will be able to:

A1. Mathematics and Applied Science that is relevant to the various disciplines within the Building Services Engineering industry.

A2. The fundamental concepts, principles and theories of Building Services Engineering relevant to the student's area of specialisation

A3. Legal, economic, design, environmental business and management techniques that are relevant to Building Services Engineers and other professionals working within the construction and building services industries

A4. Detailed knowledge and critical understanding of the essential facts, concepts, principles and theories relevant to the student's area of specialisation

A5. An understanding of the limits of their knowledge of their own specialist areas together with other associated building services fields and how this influences analysis and interpretations based on that knowledge.

Teaching, learning and assessment methods used to enable outcomes to be achieved and demonstrated

Core principles knowledge and understanding will be acquired through conventional approaches to module delivery. This will include formal lectures, coursework tasks and guided independent study.

A3 Knowledge and understanding of the legal, economic, design, environment, business and management techniques will also be developed via the students experience in their working environment. Specific work based modules will require the students to analyse and comment on their work experiences and the techniques and practices to which they are exposed.

Additionally, a variety of learning strategies will be employed which will require students to take an active role in their learning. This will include work based projects, team work projects, and formal student presentations to panels of experts.

In all modules, students will be given written and verbal feedback on their work.

Assessment

Details concerning assessment arrangements and the testing of specific learning outcomes are included in the module pro-formas. Modules are examined by a variety of methods including formal unseen examination, group and individual project based coursework. controlled assignment, classroom tests, group and individual presentations and interview by expert panel. There is a strong emphasis on the use of simulated building services projects on real buildings which the students will carry out both in groups and individually.

Skills and other attributes

Intellectual Skills

A student who is eligible for this award will be able to:

B1. The ability to identify and solve problems

B2. The ability to evaluate critically the appropriateness of different approaches to solving problems and make improvements.

B3. The ability to apply solutions to real building services engineering industrial needs

B4. The ability to analyse and evaluate concepts and theories

B5. The ability to critically analyse and integrate information and data from a variety of sources.

Teaching, learning and assessment methods used to enable outcomes to be achieved and demonstrated

Practical case studies will be used in order to develop relevant skills and the confidence to use them. These will be carried out in small groups in a project team environment. Analysis and problem-solving skills are developed through case studies and a variety simulated building services projects based on real buildings.

Assessment

Assessment of the students intellectual skills are carried out by a variety of means. This will include formal assessment in conjunction with the assessment of the learning outcomes of individual or integrated modules together with the peer appraisal associated with team projects and the formal assessment of the individual project submitted at the end of the second year of the programme.

Professional practical skills

A student who is eligible for this award will be able to:

C1. Make technical presentations to specialist and non-specialist audiences.

C2. Use construction and building services engineering literature effectively

C3. The ability to work as an effective member of a team.

C4. Use standard as well as specialist building services engineering, commercial or construction computational tools and packages effectively.

C5. Analyse surveys, reports, data, information and experimental results accurately.

C6. Prepare technical reports/drawings appropriate for a range of technical and non-technical purposes.

Teaching, learning and assessment methods used to enable outcomes to be achieved and demonstrated

The acquisition of practical skills will be encouraged and developed within the individual modules in general and the use of assessment based on simulated building services projects in real buildings in particular.

C1, C5 & C6 will additionally be developed via specific work based modules will require the students to analyse and comment on their work experiences and the techniques and practices to which they are exposed.

C3 & C4 will be a key feature in the completion of the modules for both group and individual project work.

C6 will be developed via a variety of group projects featured in several modules. These are detailed in the individual module pro-formas.

Assessment

Students' practical skills will be assessed within discrete modules via formal coursework assignments linked to a variety of case study material.In the Group and Individual Building Services Integrative Project modules, students will be informally tested at various review points throughout the project and, formally, by interview with a professional panel of managers and experts drawn from industry.

Transferable / key skills

A student who is eligible for this award will be able to:

D1. the ability to improve their own learning.

D2. well developed communication skills.

D3. the ability to work with others.

D4. the ability to use information technology effectively.

D5. the ability to manage resources and time effectively.

D6. the ability to transfer techniques and solutions from one field of Building Services engineering to another

Teaching, learning and assessment methods used to enable outcomes to be achieved and demonstrated

Key skills are developed throughout the programme which aims to provide students with an appropriate environment in which to acquire and develop the necessary attributes of a Building Services Engineer or Surveyor and the confidence to apply them. The Group and Individual Building Services Integrative Project modules in particular require the students to complete a major simulation based on a real building which progresses through various project stages relevant to the particular building services specialist subject . Students will work in both small groups and as individuals to specific deadlines and they will be challenged at each stage via peer reviews, presentations and interviews with project staff.

Assessment

Students' key skills will ultimately be tested In the Group and Individual Building Services Integrative Project modules via a formal presentation to a panel of industry experts selected for their particular experience and expertise within the field of building services. Students will be interviewed and questioned on their submission and their ability to 'think on their feet' will be tested in conjunction with the management skills acquired during the programme of study.

Programme structure - programme rules and modules

Programme rules

The programme is primarily offered in part-time day release mode and the course of study will normally be completed within two academic years. Alternatively a full-time student may complete the programme within one academic year.

For the award of an HNC students must attain a minimum of 120 credits at level 4.

The programme consists of four core modules, three of these having a credit value of 24 while the fourth has a credit value of 12, and one 36 credit specialist option module.

For the award of an HNC students will be required to complete all core modules and one specialist modules corresponding to the pathway chosen. These are:

Mechanical pathway - 4504BEFDL Mechanical Services Installations, Electrical pathway - 4505BEFDL Electrical Services Installations, and Commercial pathway - 4506BEFDL Measurement, Tendering, Estimating and Technology for Building Services Engineering.

Level 4	Potential Awards on completion	Higher National Certificate
Core	Option	Award Requirements
4500BEFDL MATHEMATICS & SCIENCE FOR BUILDING SERVICES APPLICATIONS (24 credits) 4501BEFDL MANAGEMENT OF HEALTH & SAFETY PROCEDURES (12 credits) 4502BEFDL BUILDING SERVICES INTEGRATED GROUP PROJECT (24 credits) 4503BEFDL WORK BASED LEARNING (TRAINING, DEVELOPMENT & CPD) (24 credits)	4504BEFDL MECHANICAL SERVICES INSTALLATIONS (36 credits) 4505BEFDL ELECTRICAL SERVICES INSTALLATIONS (36 credits) 4506BEFDL MEASUREMENT, TENDERING, ESTIMATING & TECHNOLOGY FOR BUILDING SERVICES ENGINEERING (36 credits)	84 core credits at level 4 36 option credits at level 4

Information about assessment regulations

All programmes leading to LJMU awards operate within the University's Academic Framework.
https://www.ljmu.ac.uk/about-us/public-information/academic-quality-and-regulations/academic-framework

Opportunities for work-related learning (location and nature of activities)

This programme includes a core module where work based learning is assessed. Several of the other modules may be considered as work related learning in that they relate to skills and attributes which are either immediately transferable to the student's working environment, or to learning where the student is required to apply experience obtained from his/her work environment to complete tasks in the college environment.

It is anticipated that most, if not all, students pursuing this programme will be employed full-time in a suitable role in the Building Services industry, and therefore the work based element of the programme will be provided by the students' own employment experiences.

Criteria for admission

A/AS Level
GCE A Level including appropriate maths and science related subjects

A suitable combination of GCE A Levels and GCSE grades A to C

Candidates who have an appropriate A Level profile but no prior learning in Building Services Engineering may be directed to a preparatory programme to provide them with the appropriate grounding.

BTEC National Diploma
BTEC National Certificate or Diploma in a related area (pre 2011)

BTEC Level 3 Diploma or Extended Diploma in a related area (post 2011)

AVCE
AVCE/GNVQ in an appropriate vocational area.

Other
It is anticipated that the majority of the students starting this programme will be employed in an appropriate capacity within the building services industry. As there is a significant emphasis on Work Based Learning within the programme there is a requirement for any applicant who is not currently in such employment to undertake a period of sustained work placement. There is an expectation that applicants will have some prior learning of

Building Services Engineering.

Mature entry
Applicants will normally be expected to hold one of the above qualifications Candidates exceptionally, may qualify for entry to the course on the basis of considerable experience deemed appropriate by the Faculty which would be subject to scrutiny under the APEL regulations.

Overseas qualifications
Overseas candidates would normally be expected to possess one of the above entry qualifications and be able to demonstrate a suitable standard of written and spoken English (IELTS 6 or equivalent).

External Quality Benchmarks

All programmes leading to LJMU awards have been designed and approved in accordance with the UK Quality Code for Higher Education, including the Framework for Higher Education Qualifications in the UK (FHEQ) and subject benchmark statements where applicable.

The University is subject to periodic review of its quality and standards by the Quality Assurance Agency (QAA) Published review reports are available on the QAA website at www.qaa.ac.uk

Programmes which are professionally accredited are reviewed by professional, statutory and regulatory bodies (PSRBs) and such programmes must meet the competencies/standards of those PSRBs.

Support for students and their learning

The University aims to provide students with access to appropriate and timely information, support and guidance to ensure that they are able to benefit fully from their time at LJMU. All students are assigned a Personal Tutor to provide academic support and when necessary signpost students to the appropriate University support services.

Students are able to access a range of professional services including:

- Advice on practical aspects of study and how to use these opportunities to support and enhance their personal and academic development. This includes support for placements and careers guidance.
- Student Advice and Wellbeing Services provide students with advice, support and information, particularly in the areas of: student funding and financial matters, disability, advice and support to international students, study support, accommodation, health, wellbeing and counselling.
- Students studying for an LJMU award at a partner organisation will have access to local support services

Methods for evaluating and improving the quality and standards of teaching and learning

Student Feedback and Evaluation

The University uses the results of student feedback from internal and external student surveys (such as module evaluations, the NSS and PTES), module evaluation questionnaires and meetings with student representatives to improve the quality of programmes.

Staff development

The quality of teaching is assured through staff review and staff development in learning, teaching and assessment.

Internal Review

All programmes are reviewed annually and periodically, informed by a range of data and feedback, to ensure quality and standards of programmes and to make improvements to programmes.

External Examining

External examiners are appointed to programmes to assess whether:

- the University is maintaining the threshold academic standards set for awards in accordance with the FHEQ and applicable subject benchmark statements
- the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with University policies and regulations
- the academic standards are comparable with those in other UK higher education institutions of which external examiners have experience
- the achievement of students are comparable with those in other UK higher education institutions of which the external examiners have experience

and to provide informative comment and recommendations on:

- good practice and innovation relating to learning, teaching and assessment observed by external examiners
- opportunities to enhance the quality of the learning opportunities provided to students

Please note:

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content, teaching, learning and assessment methods of each module can be found in module and programme guides.