

**Building Services Engineering**  
Programme Handbook

**School of the**

# Built Environment



# What is the Built Environment?



## People

Buildings are for people and they have an enormous impact on our daily lives. They are for home, work, leisure and function. They can be inspiring or depressing but whichever way we look at it, buildings are the fabric of the society which inhabits them. Working in the Built Environment you will play a part in delivering a unique and innovative product for this society.

## History

Buildings last a long time, especially if they are well built and designed. They give an identity to a location and there are countless examples of this across the globe. You will learn how architecture and building technology has evolved since the past and how time has given us the rich built environment we have today.



## Teamwork

Working as a team is essential to the development, design and construction of successful buildings. This is one of the most important skills you will learn, and you will have lots of practice of this in the School of the Built Environment. You will also have the opportunity to work in one of the most creative and dynamic of businesses with likeminded individuals who want to create great buildings.

## Sustainability

The built environment produces lots of pollution. It will be your job to make sure new buildings produce much less for the future as well as working on the old buildings to clean them up. There is a world out there that needs your help to survive.



## The Future

– is in your hands. You will be developing, designing and constructing the buildings of the future. Take this responsibility seriously; study the interplay of architecture, society, culture and the economy to build buildings which will stand the test of time.

# The Programme Team

## Programme Leader

Each programme has a Programme Leader, ultimately responsible for its smooth running and organisation. The Programme Leader for the Building Services Engineering programme is Lawrence Hughes.

## Year Tutors

The role of year tutors is to co-ordinate the teaching, coursework, visiting speakers, attendance etc and generally ensure the smooth running of the course.

### The Year Tutors are:

Year 1 Jess Tindall  
Year 2 Paul Staiss  
Year 3 Paul Staiss  
Year 4 Jerry Edge

## Teaching Team

The main staff you will come across from the School are as follows:-

Name	Room	Tel	Email
Zaid Alwan	WJ202	243 7146	zaid.alwan@northumbria.ac.uk
Peter Beacock	C202	227 3528	peter.beacock@northumbria.ac.uk
Jerry Edge	A217a	227 4728	jerry.edge@northumbria.ac.uk
Dave Giddings		2274344	dave.giddings@northumbria.ac.uk
John Holmes	B307	227 3651	john.holmes@northumbria.ac.uk
Lawrence Hughes	A211	227 4914	lawrence.hughes@northumbria.ac.uk
Patrick Jemmer		243 7679	patrick.jemmer@northumbria.ac.uk
Lesley Matthews	B205	243 7987	lesley.matthews@northumbria.ac.uk
Stephen McGlen	A205	243 7064	stephen.mcglenn@northumbria.ac.uk
Bobo Ng	WJ201	243 7181	bobon.g@northumbria.ac.uk
Victor Samwinga	A212	227 4556	victor.samwinga@northumbria.ac.uk
Paul Staiss	A217a	227 4699	paul.staiss@northumbria.ac.uk
Kevin Thomas	A202	227 4743	kevin.thomas@northumbria.ac.uk
John Thornton	B304	227 3514	john.thornton@northumbria.ac.uk
Jess Tindall	A217a	227 4415	jess.tindall@northumbria.ac.uk
Chris Underwood	WJ205	227 3533	chris.underwood@northumbria.ac.uk
Sara Walker	B308	227 3286	sara.walker@northumbria.ac.uk

## Programme Administration

Duncan Attwell	B201	243 7346	duncan.attwell@northumbria.ac.uk (Senior Administrator)
Hazel Fiddes	B201	227 4460	hazel.fiddes@northumbria.ac.uk (Programme Administrator)

## Guidance Tutor

You will be allocated a Guidance Tutor, a member of academic staff who had the duty of providing you with advice on academic, procedural and (where desired and appropriate) personal matters. Where possible, you will retain the same Guidance Tutor throughout your time at Northumbria.

You will be expected to consult with your guidance Tutor during induction week, and regularly thereafter, including whenever modular or progression results are available, and whenever option choices have to be made.

You may in addition ask for a meeting with your Guidance Tutor at any time.

## How to contact Tutors

### Appointments

Academic staff teach on many modules/Programmes and it is advisable to make an appointment if you wish to see them. Occasionally you may be able to have an immediate appointment, but don't be disappointed if you are asked to return at a mutually convenient time. Please contact staff to cancel if you are unable to make the arranged appointment.

The Programme Leader normally allocates time during the week when he will be available, but please feel free to see them at any time if the situation is urgent.

### Notice Board and Blackboard

The main point of contact for staff with students is the Programme notice board or via Blackboard announcements. This could be timetable changes, assessment information or personal messages.

**YOU MUST REGULARLY CHECK THE NOTICEBOARDS AND BLACKBOARD ANNOUNCEMENTS.**

It is particularly important to check notices at the start of the semester when timetable changes are more likely and towards the assessment period when important information will be displayed.



## Email

While the telephone usually gives immediate access, e-mail is used extensively throughout the University and is a very effective method of two-way communication between students and staff. You should automatically be allocated an e-mail address by the University once you have enrolled.

Do remember that the Northumbria e-mail address will be the one that is used to make contact with you so do make sure that you check it regularly, particularly if you use a personal e-mail account. You must regularly delete old e-mails from your University e-mail account, otherwise your inbox will become full and you will stop receiving e-mails.

## Room Locations

Much of your teaching will take place in Ellison Building but you may be required to go to other parts of the University for classes. The building/room abbreviations will be explained when you receive your timetable.

## Programme Structures

In line with other academic institutions, the University operates a unitised system of programmes. Each undergraduate degree is made up of three academic levels – levels 4, 5 and 6.

### Level 4

Level 4 modules introduce the student to a range of formation studies to ensure a basic knowledge and understanding of the main programme subject areas to underpin the whole academic programme along with an insight into the structure of the industry and the professions operating within the Built Environment. Project activity aims to provide the bridge and link between all discrete subject areas to examine the holistic dimension of the building process from inception to completion.

### Level 5

Level 5 modules extend the factual knowledge and understanding in each of the main subject areas and are intended to increase a student's ability to take responsibility for their own learning.

### Placement Year

A professional placement year is available for those who wish to take it. It can form a critical element within a course by providing students with opportunities of experience and insight into "real world" practices and problems which are intended to build on and develop their own interpersonal skills and effectiveness. It is also intended that this experience will be used to introduce and enable practical relevance to Level 6 subject modules.

### Level 6 – Final Year

This consolidates Levels 4 and 5 and provides the final academic challenge for the student as demonstrated by an ability to deal with decision making at strategic levels; identification and analysis of problems; to synthesise solutions. A major focus of activity will be the final year Design Project module where opportunities will be provided for each student to demonstrate their full range of personal transferable skills.

## Modules

Each module on the course carries credit points.

Single module = 10 credit points

Double module = 20 credit points

Triple module = 30 credit points

Each 10 credits represents 100 hours of student work load which on average equates to about 6–7 hours per week of lectures, seminars, preparation, revision, assessment etc.

Staff contact time will be approx 10–15 hours per week. Your own self managed study time should amount to approx 30–35 hours per week.

# The Degree Award

## Credit Requirements

To obtain a degree, a student must achieve a certain number of credit points as follows:

Full time degree (no placement year)	360 credit points (120 per academic year)
Sandwich degree (inc placement year)	400 credit points (as above with 40 extra credits for the placement)
Part time degree	360 credit points

## Educational Aims of The Programme

### B Eng (Hons) Building Services Engineering

The B Eng (Hons) Building Services Engineering route is intended to be a vocational programme giving a broad education which provides sufficient specialised knowledge to equip graduates for a future professional career. The programme is designed to meet the educational objectives and academic standard required for Engineering Council and Chartered Institution of Building Services Engineers accreditation.

### Programme philosophy

A fundamental understanding of theoretical studies including Physical Sciences and Mathematics is supported by relevant examples taken from the building services industry. The fundamental principals are applied through design calculation methods and computer aided design to the specialist technology needed in the building services. Technical proficiency and knowledge is developed through application of theoretical studies in Design and Practice project work which simulates the professional environment. The supervised industrial placement in the building services industry consolidates and extends the knowledge in engineering, design and management. The programme culminates with a major demonstration of design and practice (Design Project).



### Part-time Programme

The B Eng(Hons) part-time follows the same structured modular system as the full-time course and this allows students to sit-in with full time students for the formal teaching periods.

Each programme is also studied in the wider context of the natural and built environments and is informed by current and prospective professional practice as well as research and academic debate. There is a vocational focus which aims to equip graduates with those personal and professional skills that are necessary for employment, whilst broadening understanding of the changing needs of society, the concept of sustainable development of the built environment, the maintenance of appropriate ethical

standards and the regulatory framework within which work is conducted.

Each programme aims to develop a range of student's abilities to enable them to:

- work collaboratively within an interdisciplinary environment
- evaluate and apply acquisition methodologies
- be independent thinkers and learners
- demonstrate the appropriate use of IT
- challenge routine and influence change
- evaluate data and solve problems
- manage information
- communicate effectively

# Learning Outcomes for BENG (Hons) Building Services Engineering

## Knowledge and Understanding

On completion of this programme, the **Building Services Engineering** student will be able to

- Demonstrate knowledge of human environmental and comfort criteria.
- Demonstrate knowledge of the building as a climate modifier.
- Understand theoretical reasoning relating to environmental and system design parameters.
- Describe construction forms and understand their physical characteristics in relation to heat, light and sound.
- Apply knowledge of Building Services Engineering systems and their accommodation within buildings.
- Demonstrate knowledge of engineering science theory.
- Describe sustainable objectives and use appropriate indicators for sustainability in the Built Environment.

## Intellectual Skills

On completion of this programme, the **Building Services Engineering** student will be able to:

- Identify physiological science relating to thermal, visual and acoustic environments.
- Apply business and management theory.
- Critically analyse the theory of building load calculations and performance.
- Evaluate light in architecture and the design of lighting systems.
- Critically evaluate building and environmental systems performance.
- Produce performance analysis of buildings and systems and devise design strategies.

## Practical Skills

On completion of this programme, the **Building Services Engineering** student will be able to:

- Carry out building load evaluation calculations and propose modifications to achieve low energy sustainable designs.
- Carry out design calculations for specific internal environments using passive and active system designs.
- Apply fundamental theory to practical/laboratory situations to reinforce theoretical study.
- Carry out the design of mechanical and electrical Building Services Engineering systems.
- Produce quality design documentation including evaluation, selection and specification reports.
- Work effectively within a construction design team and be a reflective practitioner towards a common aim.
- Measure a built environment development for its alignment with sustainable objectives.

## Transferable/Key Skills

On completion of this programme, the **Building Services Engineering** student will be able to:

- Apply numeric solutions in problem solving.
- Relate professional and specialist roles throughout the building industry.
- Communicate effectively and understand others views.
- Use current IT skills to produce documents, spreadsheets, presentations and drawings.
- Apply personal and resource management skills.

There is a national requirement that all programmes of study have a publicly available 'Programme Specification'. The Programme Specification provides an account of the 'Learning Outcomes' of a programme of study (broadly – the student's capabilities of the programme) and how these are to be achieved in a structured way by progression through the programme.

This section of the handbook is based on the Programme Specification for your programme. The full and definitive version can be found at <http://allertonavenue.campus.unn.ac.uk:8080/programmespecs/>.

# Sandwich Degree Programme

Second Year Structure (Level 5)						
<b>Semester 1</b>	The Design of Lighting Within Buildings BE0850 (10 credits)	Further Mathematics for Building Service Engineers MS0279 (10 credits)	Air Conditioning Systems 1 BE0370	Heating Systems BE0644	Building Analysis and System Design Project BE0750	Building Services Engineering Science 2 BE0847
<b>Semester 2</b>	Construction Management BE0376 (10 credits)	Electrical Principles for Building Services BE0851 (10 credits)	(20 credits)	(20 credits)	(20 credits)	(20 credits)

Year 3 (Level 5) - Placement Year						
Professional Experience Placement BE0744 (40 credits)						

Year 4 (Final Year) (Level 6)						
<b>Semester 1</b>	Design Project BE0637	Electrical Installation BE0854 (10 Credits)	Heating and Air Conditioning Control Systems BE0856 (10 Credits)	Air Conditioning Systems II BE0852	Renewable Energy and Low Carbon Systems BE0853	Project Design and Management BE0858
<b>Semester 2</b>	(30 credits)		Applied Acoustics BE0855 (10 credits)	(20 credits)	(20 credits)	(20 credits)

# Part-time Programme

The part time degree takes five years to complete.

Year 1 (Level 4)			
<b>Semester 1</b>	Human Comfort: Environmental Awareness BE0828 (10 credits)	Constructional Environmental & Structural Technologies BE0823  (20 credits)	Fundamental Mathematics MS0405  (20 credits)
<b>Semester 2</b>	Thermal Visual and Acoustic Analysis BE0842 (10 credits)		

Part-time Year 2 (Level 4)			
<b>Semester 1</b>	Sustainable Development BE0966 (10 credits)	Business in the Built Environment BE1060  (20 credits)	Building Services Engineering Science 1 BE0843  (20 credits)
<b>Semester 2</b>	Energy Systems in Dwellings BE0963 (10 credits)		

Part-time Year 3 (Level 5)				
<b>Semester 1</b>	Further Mathematics MS0279 (10 credits)	Air Conditioning Systems I BE0370  (20 credits)	Heating Systems BE0644  (20 credits)	Building Services Engineering Science 2 BE0847  (20 credits)
<b>Semester 2</b>	Electrical Principles for Building Services BE0851 (10 credits)			

Part-time Year 4 (Levels 5 & 6)				
<b>Semester 1</b>	The Design of Lighting Within Buildings BE0850 (10 credits)	Buildings Analysis and System Design Project BE0750  (20 credits)	Air Conditioning Systems II BE0852  (20 credits)	Renewable Energy and Low Carbon Systems BE0853  (20 credits)
<b>Semester 2</b>	Construction Management BE0376 (10 credits)			

Part-time Year 5 (Level 6)				
<b>Semester 1</b>	Electrical Installation BE0854 (10 Credits)	Design Project BE0637  (30 credits)	Heating and Air Conditioning Control Systems BE0856 (10 Credits)	Project Design and Management BE0858  (20 credits)
<b>Semester 2</b>			Applied Acoustics BE0855 (10 credits)	

## Independent Learning

Level six modules enable students to apply the knowledge and understanding acquired at level five to the development of an in-depth understanding of Building Services Engineering issues. Modules at this level also allow students to critically reflect on practice through applied study. The emphasis is on the students developing an analytical understanding through application and evaluation. Increased independent learning and the setting of tasks aim to facilitate this. The teaching and learning approach at level six encourages discussion and debate and allows students to develop their capacity to evaluate relevant issues. Students are expected to be self-motivated and to work within a culture of student centred and independent learning and, to this end, to take responsibility for their own learning particularly at this final stage of a degree programme.

Each of the modules represents a notional student workload (NSW) of 100 hours. Each module will have an apportionment of the NSW for lectures, seminars and assessment, together with time for directed and independent learning. At level 6 it is particularly important to realise that this directed and independent learning is an essential aspect of your learning. It is your responsibility to ensure that you carry out the required independent and directed learning to support the teaching contact time.

### Field Study Visit

During semester 1, discipline specific field study visits may be undertaken. These visits are expected to last between 3-6 days. Year tutors will advise you as to the location of the visit. You will be required to contribute to the accommodation and subsistence charges of your particular field study visit. The purpose of these visits is to show you relevant issues to your studies in another location and to help you get to know your peer group.

## Assessment Regulations For Northumbria Awards

The Assessment Regulations for Northumbria Awards (ARNA) are the standard regulations which apply to all of the University's academic programmes. Any variations to ARNA have to be approved for a particular programme. For full details please go to the <http://northumbria.ac.uk/sd/central/ar/lts/assess/>

## Module Descriptors

Module Descriptors give information about each module (subject) delivered on your programme.

### How to Obtain a Module Descriptor from the University's Website

First, open up Internet Explorer or Netscape Navigator and log into the Northumbria University website at <http://northumbria.ac.uk/>. Click on:

1. Students
2. My Northumbria
3. Module Search
4. Type in module code
5. Click on 'Go'

Or alternatively, type the following address into your browser:

<http://sits.unn.ac.uk/live/webserv/mod.php>

