

College of Built Environment

Academic Year 2023/24 - Semester 1

Please note: although we will try our best to avoid it, there may be timetable clashes when choosing modules across different levels and different courses (so you might have to choose alternative modules).

Click on the module name to see the module specification.

Module Code	Name	Level Code	BCU Module Credits	ECTS
BNV4103	Built Environment Technology 1	4	20	10
BNV4106	Introduction to the Built Environment	4	20	10
BNV4108	Law	4	20	10
BNV4111	Construction Technology	4	20	10
BNV4112	Science and Materials	4	20	10
BNV4113	Individual Project	4	20	10
BNV4115	Management and Practice in Construction	4	20	10
BNV4125	Civil Engineering Design Project	4	20	10
BNV4126	Civil Engineering Principles 1	4	20	10
BNV4134	Architectural Design Studio 1	4	20	10
BNV5106	Cost Management	5	20	10
BNV5110	Building Pathology	5	20	10
BNV5112	Design and Development in the Built and Natural Environment	5	20	10
BNV5116	Property Law	5	20	10
BNV5118	Civil Engineering	5	20	10
BNV5119	Procurement	5	20	10
BNV5123	Soil Mechanics	5	20	10
BNV5124	Structures 1	5	20	10
BNV5125	Design Practice	5	20	10
BNV5128	Built Environment Technology 2	5	20	10
BNV5129	Built Environment Commercial Technology	5	20	10
BNV5150	Technological Design Studio 1	5	20	10
BNV6120	Project Management	6	20	10
BNV6123	Applied Valuation	6	20	10
BNV6124	Drivers of Change	6	20	10
BNV6126	Property Fund Management	6	20	10
BNV6128	Urban Design Practice in Context	6	20	10
BNV6131	Hydraulics and Drainage	6	20	10
BNV6133	Digital Design Practice with Existing Buildings	6	20	10
BNV6135	Structures 2	6	20	10
BNV6205	Bid Strategy and Professional Practice	6	20	10

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Module Summary Information

1	Module Title	Built Environment Technology 1
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4103

5	Module Overview
This module introduces, for all of the built environment professions, a range of concepts relating to the technology of construction. It provides you with an understanding of modern and sustainable methods of construction. We use the example of low rise residential construction as it is relatively straightforward and allows us to introduce and explore these issues appropriately. In particular, you will be introduced to everyday materials, construction methods, building services Building Regulation and Health, Safety and Welfare legislation. You will gain an insight into the properties of materials and the basic scientific principles that apply to them. The module will focus on construction materials in general and how they can be used in creating a construction element and/or component (e.g. a floor, an external wall, a roof). You will develop the ability to identify, describe and visualise these materials in terms of types, dimension, size and weight. Individually you will use or develop a virtual building model in a way appropriate to your particular specialism (AT, BS, CM, PDP, QS and RE).	

6	Indicative Content
Preparing to build: site appraisal and investigation. Building Regulations, Health, Safety and Welfare. Substructure: foundations and ground floors. Superstructure: external walls, upper floors and roofs. Windows and external doors. Stairways, partitions and internal doors. Building services and equipment: water, drainage and sanitation. Energy systems: gas, electricity, data and controls Materials, components and specification. Building Information Modelling (BIM). Sustainable solutions: low and zero carbon homes, modern methods of construction and renewable energy sources.	

7	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Explain the terminology used in the construction of low-rise residential buildings.
	2	Recognise the key characteristics of different construction materials and how they are combined in buildings; structure, fabric, components and finishes.
	3	Describe how performance requirements of building elements and emerging technologies inform technical innovation and development of new materials.
	4	Discuss the principal legislation and regulations that affect construction technology and their influence on new environmental technologies.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		

9	Breakdown Learning and Teaching Activities	
Learning Activities		Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable		48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE		36
Private Study (PS) includes preparation for exams		116
Total Study Hours:		200

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1	Module Title	Introduction to the Built Environment
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4106
5	Semester Taught	1

6	Module Overview
This module explores how key 'actors', including professional bodies, landowners, developers, investors, politicians, members of the public, and the state, etc. influence the development of the built and natural environment. Broader forces also influence development processes. This module therefore encourages you to explore how Politics, Economy, Society, Technology, Law and the Environment (PESTLE) all shape the built and natural environment. This module also offers an opportunity not only to look at past and current trends, but potential future trends that influence development, including significant issues such as governance, resource availability and climate change; and a chance to learn how development processes occur at different spatial scales and contexts. Recognising and appreciating how the development process functions is important, as all built environment professionals have a responsibility for seeking to resolve development conflicts, consider resources, and deliver long-term sustainable development. In groups, you will research and present ideas about current thinking relating to PESTLE and the actors involved with the development process. You will also develop your professional presentation, academic research and client care skills.	

7	Indicative Content
Themes within this module include: - Actors and stakeholders in the built and natural environment – landowners, developers, investors, politicians and the public - Strategic Planning for Cities – Birmingham City Council - Stages of Development – RIBA Plan of Works - The environment and sustainability - Regulation and development - Health, Safety & Wellbeing. Implications of the Health and Safety at Work etc. Act 1974 and subsequent regulation - Technology for the Built Environment - Economics and development - International drivers in the Built Environment - Supply chain issues - Governance in the Built and Natural Environment - Capacity-building - Importance and role of professional bodies, membership, Codes of Conduct and ethics, recognising equality and diversity in the built environment - Broader forces influencing the development process. politics, economics, fair trade and development • Society, technology and development - Research and critical thinking skills	

- Analysis techniques – PESTLE
- Planning for career development – professional skills

8	Module Learning Outcomes		
	On successful completion of the module, students will be able to:		
	1	Identify and describe the roles of different actors in shaping the development of the built (and natural) environment.	
	2	Discuss the importance of external factors such as politics, economy, society, technology, law and the environment (PESTLE) in influencing development in the built (and natural) environment.	
	3	Explain how internal organisational and business management factors influence delivery of developments.	
	4	Demonstrate key competencies, skills and attributes for effective professional practice.	

9	Module Assessment		
Learning Outcome Number (from table 8)	Coursework	Exam	In-Person
1-4	X		
1-4			X

10	Breakdown Learning and Teaching Activities		
Learning Activities	Hours	Details of Duration, Frequency and other comments	
Scheduled Learning (SL) includes lectures, practical classes and workshops as specified in timetable	48	1 hr lecture for 12 weeks 3 hr seminar for 12 weeks	
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE	70	On-line activity Graduate+ peer learning external visits	
Private Study (PS) includes preparation for exams	82	students use the time for preparation for coursework submissions, addressing feedback from academic team from formative feedback	
Total Study Hours:	200		

11	Key Texts and Online Learning Resources
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Essential (Books/Journals/Specific chapters/Journal Articles)

- As directed: BRE Digests, British and International Standards, Acts regulations and guidance as needed (including Health and Safety at Work Etc. Act 1974, Equality Act 2010)
- Birmingham Development Plan 2031. Sections 1-4 at least.
https://www.birmingham.gov.uk/info/20054/planning_strategies_and_policies/78/birmingham_development_plan
- Ching, F.D.K. (2014) Architecture: Form, space, & order, 4th ed. Wiley, Hoboken
- Construction (Design and Management) Regulations 2015 - overview.
<http://www.hse.gov.uk/construction/cdm/2015/index.htm>
- Construction (Design and Management) Regulations 2015 Summary of duties
<http://www.hse.gov.uk/construction/cdm/2015/summary.htm>
- Department for Communities and Local Government (DCLG) (2018) National Planning Policy Framework, DCLG, London. <https://www.gov.uk/government/publications/national-planning-policy-framework--2>
- Ellingham, I. (2013) Whole life Sustainability. RIBA Publishing. London.
- Jowsey, E (ed) 2014 Real Estate Concepts Chapter 6 (Economics)
https://capitadiscovery.co.uk/bcu/items/summon/FETCH-ingramdigital_primary_6285883
- Professional bodies - CIAT, CIOB, RICS & RTPI websites as required
- RIBA Plan of Work <https://www.architecture.com/knowledge-and-resources/resources-landingpage/riba-plan-of-work>
- Rydin, Y. (2013) The Future of Planning: Beyond growth dependence. Policy Press, Bristol.
- Tewdwr-Jones, M. (2012) Spatial Planning and Governance: Understanding UK Planning, Palgrave Macmillan, Basingstoke.
- Adams, D Tiesdell, S (2012) Shaping places: urban planning, design, and development
<https://ebookcentral.proquest.com/lib/bcu/reader.action?ppg=1&docID=1016169&tm=1536928930350>
- Parker, S. (2011) Cities, politics & power Taylor & Francis Ltd Ebook
<https://ebookcentral.proquest.com/lib/bcu/detail.action?docID=667820>
- Temple, M (2004) Studying the Built Environment. Part 1: Themes and Challenges
<https://ebookcentral.proquest.com/lib/bcu/reader.action?docID=4763097&ppg=20>

Recommended

You will be directed towards any additional recommended readings / materials in the relevant Moodle sections.

Background

You will be directed towards any additional background readings / materials in the relevant Moodle sections.

Module Specification

Module Summary Information

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1	Module Title	Law
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4108
5	Semester Taught	1

6	Module Overview
This module is delivered to all of the undergraduate programmes in the built environment disciplines and provides you with the basic legal concepts and principles you will need throughout your professional career. It introduces you to the structure and processes of the English legal system. This is the essential foundation to the legal skills necessary for the provision of sound advice to your clients/colleagues later in your professional career; and this underpins all of the built environment professions. The module also helps all students to understand the importance of and provides an overview of the duties of all persons involved in construction projects with regard to health, safety and wellbeing. You will be presented with scenarios during this module and, with reference to existing statute and case law, you will be required to provide accurate, informed and professional advice to your client. This allows you to engage with the ideas and evidence in a real-life, practice-based way, providing an exciting opportunity to produce work as you would in practice.	

7	Indicative Content
• Legal and regulatory frameworks which shape the design, development and management of buildings and places. • English legal system and how laws are made. • Contract Law. • Tort law including nuisance, negligence and occupiers' liability. • Legal environment and the terminology of health and safety as it applies to the design and management of construction projects including the role of the main parties. • The module will also consider legal issues specific to different professions including construction contract, landlord and tenant, Town and Country Planning etc.	

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-3	X 60%		
4			X 40%

9	Module Learning Outcomes	
	On successful completion of the module, you will be able to:	
	1	Describe and apply the legal and regulatory frameworks influencing design, development and management of buildings and places and the appropriate methods of dispute resolution when problems arise.
	2	Identify and apply the essential elements involved in contract formation, breach and remedy.
	3	Explain the causes and implications of various torts as they apply to your professional area.
	4	Employ professional communication skills.

10	Breakdown Learning and Teaching Activities		
Learning Activities		Hours	Details of Duration, Frequency and other comments
Scheduled Learning (SL) includes lectures, practical classes and workshops as specified in timetable		48	2 hr lecture for 12 weeks 2 hr seminar for 12 weeks
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE		62	On-line activity Graduate+ peer learning peer group learning external visits
Private Study (PS) includes preparation for exams		90	Secondary Research
Total Study Hours:		200 notional learning hours	

11	Key Texts and Online Learning Resources
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Essential (Books/Journals/Specific chapters/Journal Articles)

Wild, C. and Weinstein, S. (2013) *Smith and Keenan's English Law* Pearson, London. Available from: <http://www.mylibrary.com?ID=502443>

Westlaw.uk – essential cases etc. will be identified in the various sessions, which can be found on this site. <https://login.westlaw.co.uk/maf/wluk/api/tocectory?sttype=stdtemplate&stnew=true>

Recommended

Turner, C. (2014) *Unlocking Contract Law* Routledge, Abingdon.

Elliott, C. and Quinn, F. (2015) *Tort Law* Pearson Education, London.

Stranks, J. (2006) *The Health and Safety Handbook: A Practical Guide to Health and Safety Law, Management Policies and Procedures* Kogan Page, London.

You will be directed towards any additional recommended readings / materials in the relevant Moodle sections

Background

You will be directed towards any additional background readings / materials in the relevant Moodle sections.

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Module Summary Information

1	Module Title	Construction Technology
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4111

5	Module Overview
The basic principles of construction technology have not changed for hundreds of years. However, the materials and techniques used to achieve these basic principles are constantly evolving; to enable the construction industry to deliver better quality buildings. Scarcity of resources and the continuing demand of more sophisticated clients, end users and other stakeholder interests, are driving the construction industry to provide buildings which facilitate enhanced environmental and energy performance, and greater flexibility, in response to ever increasing financial, environmental, legal and economic constraints This unit will introduce the different technological concepts used to enable the construction of building elements; from substructure to completion, by understanding the different functional characteristics and design considerations to be borne in mind when selecting the most suitable technological solution. Resources for learning, teaching and assessment will all be available on the university virtual learning environment (VLE), Moodle. Delivery will be by a series of lectures, practical classes and workshops all teaching space-based. Assessment will be based on an individual student portfolio containing one or more tasks, formative feedback will be given during the practical classes and workshops.	

6	Indicative Content
Topics included in this unit are: substructure, superstructure, finishes, building services and infrastructure components. The principles of buildability in terms of health and safety, efficiency, economy, sustainability and quality are considered.	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
1	Explain the terminology used in construction technology.
2	Describe the different techniques used to construct a range of substructures and superstructures, including their function and design selection criteria.
3	Identify the different types of civil engineering/infrastructure technology used in support of buildings.
4	Illustrate the supply and distribution of a range of building services and how they are accommodated within the building.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		

9	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	60	
Private Study (PS) includes preparation for exams	92	
Total Study Hours:	200	

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Module Summary Information

1	Module Title	Science and Materials
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4112

5	Module Overview
The module combines environmental science, materials science, and principles of construction management, in order to provide the students with an awareness of the properties, behaviour, and use of construction materials and the application of scientific principles to the design and use of buildings. It encourages students to consider how these properties affect the design and use of buildings, both from a professional's and a user's perspective. The module commences with introducing the key scientific methods, based on mathematics and physics, which underpin the design of buildings. It proceeds with a coverage of the environmental performance of buildings, with an emphasis on the aspects that affect user comfort, such as heat, light, and sound. The structural performance of buildings is addressed via key aspects of materials science, including the design of a building component. The module concludes with a coverage of contemporary issues on materials-related aspects, such as sustainability, health and safety, and design management regulations. The module employs a range of approaches and learning materials, reflecting the varied nature of the content. Directed learning exercises are employed so the students produce a portfolio of work at the end of the semester, exploring the issues covered in class. Design exercises are combined with experimental work in order to assess the environmental and structural performance of building components. A group exercise covers the design management and sustainability aspects, encouraging students to collaborate. Besides the subject knowledge, the module also provides an excellent opportunity for students to develop their written, verbal, analytical, teamwork, and other employability skills.	

6	Indicative Content
1. Identify and explain common terminology relating to environmental and materials science • Notation and concepts in environmental and materials science. • Principles of mathematics. • Units & measurements. 2. Evaluate the environmental performance of building components, with respect to human comfort and sustainability aspects, including experimental data. • Heat Transfer and Thermal Comfort Control. • Ventilation and Humidity control. • Physics of Light and Lighting Design. • Physics of Sound and Acoustic Design. • Physics of Water and Hydraulic Design.	

3. Evaluate the structural performance of building components and how they affect material choices, including experimental data.

- Structural analysis of members.
- Mechanics of materials.
- Design in concrete, steel, timber, and masonry.
- Quality control of materials.

4. Demonstrate effective group working and communication skills relating to sustainability, health and safety, and design management regulations

- Sustainability of materials
- Energy Demand and Renewable Energy.
- Health and Safety in the construction site.
- Design Management Regulations.

7 Module Learning Outcomes	
On successful completion of the module, students will be able to:	
1	Identify and explain common terminology relating to environmental and materials science.
2	Discuss the environmental performance of building components, with respect to human comfort and sustainability aspects, including experimental data.
3	Explain the structural performance of building components and how they affect material choices, including experimental data.
4	Demonstrate effective group working and communication skills relating to sustainability, health and safety, and design management regulations.

8 Module Assessment			
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		

9 Breakdown Learning and Teaching Activities	
Learning Activities	Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	60
Private Study (PS) includes preparation for exams	92
Total Study Hours:	200

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Module Summary Information

1	Module Title	Individual Project
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4113

5	Module Overview
The ability to define, plan and undertake a project is a critical set of skills needed in various roles within the construction industry. Identifying appropriate information and analysing this, to formulate clear results or recommendations, is required to underpin many of the processes that inform construction projects. The aim of this unit is to support students in using and applying the knowledge and skills they have developed through other areas of their studies to complete and present an individual project. In addition, this unit will provide students with key study skills that will support them in further study. Resources for learning, teaching and assessment will all be available on the university virtual learning environment (VLE), Moodle. Delivery will be by a series of lectures, practical classes and workshops all teaching space-based. Assessment will be based on an individual report and presentation responding to one or more tasks, formative feedback will be given during the practical classes and workshops.	

6	Indicative Content
Students will be able to identify, define, plan, develop and execute a successful project by working through a clear process. They will develop a project brief; outlining a problem that requires a solution, as well as a project specification, the specific requirements of which the final outcome must meet. They will research the problem, undertaking a feasibility study, and consider a range of potential solutions using critical analysis and evaluation techniques to test, select and contextualise their preferred solution. Students will provide a work and time management plan, keeping a diary of all activities, reflecting on their process and their learning throughout the project.	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
1	Prepare project that will provide a solution to an identified problem.
2	Demonstrate the process of the project within agreed timescales and specification; documenting the process throughout.
3	Discuss potential project management solutions.
4	Produce a project report and deliver a presentation of the final project outcomes.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		
4			X

9	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	60	
Private Study (PS) includes preparation for exams	92	
Total Study Hours:	200	

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Module Summary Information

1	Module Title	Management and Practice in Construction
2	Module Credits	20
3	Module Level	Level 4
4	Module Code	BNV4115

5	Module Overview
This module is delivered to all HNC students in the built environment disciplines and provides you with an opportunity to understand management practice and its application in the construction and built environment sector. It introduces learners to the principles and application of management as they relate to the technical and professional disciplines of construction, civil engineering and building services engineering. It is based on the principles of the <i>Latham Report of 1994</i>, which advocated non-adversarial, multi-disciplinary team working. Learners will gain an understanding of how these principles may be applied to the management of construction, building services engineering or civil engineering activities through the application of recognised management techniques.	

6	Indicative Content
The content of the module include the following key areas: 1 Describe the construction and built environment sector in terms of structures and activities <i>Structure and activities:</i> sectors e.g. construction, civil engineering, building services engineering; nature of services provided by each sector; general roles and responsibilities of members of project teams; specific roles and responsibilities of professionals within project teams <i>Organisational structures and approaches:</i> direct line; lateral, functional and staff relationships; chain of command; span of control; concepts of responsibility e.g. duty, authority, accountability, delegation; corporate theories e.g. mission, strategy, planning, policies, objectives, values; centralised and decentralised organisations; project-based organisations; job design; team structures; team- working <i>Influence of scale and size of contracts:</i> project and contract procurement; contractual methods; impact of contract on management of organisations e.g. role of designer, main contractor, sub-contractor, supplier 2 Understand the methods of procurement and contracting used in the construction and built environment sector <i>Procurement methods:</i> traditional methods of tendering; other methods e.g. partnering, public private partnerships, Private Finance Initiative (PFI); client and project objectives <i>Contracts:</i> legal definitions; forms of contract; stages within a contract; contractual obligations of performance (time, cost, quality, insurance, warranty arrangements); rights of parties to contract <i>Practice of procurement:</i> construction teams e.g. multi-disciplinary teams, integrated teams,	

partnering; government initiatives e.g. Latham Report, Egan Report; benchmarking; key performance indicators (KPIs); sustainability and environmental management issues; legislation; corporate values; professional standards

3 Discuss management techniques used in the construction and built environment sector, and the key stages in the process.

Principles of management: management pioneers and thinkers e.g. McGregor, Maslow, Herzberg, Drucker; definitions; processes e.g. forecasting, planning, organising, motivating,

controlling, coordinating, communicating

Human resources management: individuals and teams (behaviour, motivation, leadership)

Planning: project organisation (layout and accommodation, method statements, plans of work, safety plans) coordination; monitoring; control e.g. Gantt charts, critical path arrow diagrams, precedence diagrams, line of balance; manual and computer-based techniques

Procurement scheduling and control: materials; plant; supply chain management; Just In Time; recycling and safe disposal of demolished materials; waste management; scheduling; resourcing and utilisation of sub-contracted and direct labour; budget and cost control (estimated cost, planned performance cost, actual cost, cash flow) Building Information Management.

Quality control: audit; inspection; statutory liaison

Risk management: assessment; liabilities; risks; security; insurance requirements

Other considerations: workforce recruitment; training; assessment and legislative requirements e.g. equal opportunities, health and safety; information verification and control; site meetings; communication and reporting; client liaison; public liaison; government initiatives

4 Analyse the development of collaboration strategies for health and safety in the design and construction of buildings

Pre-construction regulations and legislation requirement.

Managing Health and safety in construction, Electric Fire and Gas

Controlling risk at work

Machinery and Plant

Occupational Health in Construction

Health Risk management

Exposure

Noise

Vibration

Stress and fatigue

Site safety

Safe places of work, traffic routes and vehicles, PPE, Working at height, confined space, tool box talks.

Major Stakeholders and investors

Communication

Fire and Rescue, CAC, Ethnic minorities, worker involvement.

7	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Describe the construction and built environment sector in terms of structures and activities
	2	Understand the methods of procurement and contracting used in the construction and built environment sector.
	3	Discuss management techniques for key stages used in the construction and built environment sector
	4	Identify the requirements of health and safety in the design and construction of buildings

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-2	X		
3-4		X	

9	Breakdown Learning and Teaching Activities	
Learning Activities		Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable		48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE		60
Private Study (PS) includes preparation for exams		92
Total Study Hours:		200

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1	Module Title	Civil Engineering Design Project
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4125
5	Semester Taught	1

6	Module Overview
Civil Engineering is a practical discipline, whose output is typically described in the form of design reports. Civil Engineers are required to analyse competing solutions to engineering problems, often relying on incomplete data and contradicting requirements. Moreover, the environmental impact of civil engineering projects is considerable, and it is our social responsibility to minimise it. Civil Engineers need to communicate and justify their design decisions using a variety of media, such as text, calculations, drawings, models, as well as presentations to clients and other stakeholders. Finally, Civil Engineering is a discipline that typically requires working in teams: effective and transparent teamwork is the key to a successful Civil Engineering project. This module introduces these challenges, in the context of a civil engineering design project. Working in teams, you are expected to produce a design proposal for a civil engineering project set by the tutors. Different facets of the project are explored depending on the nature of the project, covering the relevant civil engineering sub-disciplines, such as structures and geotechnics, while emphasis is paid on the environmental impact of the project. You will learn how to utilise a combination of techniques for the analysis of design problems, including both analytical work and the use of engineering software. The learning experience combines different modes of delivery: lectures introduce the theoretical background; interactive hands-on tutorials focus on delivering the project effectively and identifying optimal engineering solutions; computer labs provide the necessary training in the use of specialised engineering software. The work is assessed via a group design report and a group presentation. This module enables you to acquire key employability skills early on. You will also learn how to identify optimal engineering solutions; understand the impact of engineering decisions, including environmental impact; use state-of-the-art engineering software; present your work to colleagues, clients, and stakeholders; work in teams.	

7	Indicative Content
In this module you will be covering the following topics: • Identify the required capacity of civil engineering projects. • Develop structural engineering solutions for a civil engineering project. • Set the geotechnical requirements of civil engineering projects. • Understanding the various ways in which a civil engineering project can impact the environment. • Techniques for measuring and quantifying environmental and societal impact • Strategies for minimising negative environmental and societal impact and maximising the positive effects. • Use Computer-Aided Design software, such as AutoCAD to prepare engineering drawings.	

- Use software applications to calculate the effect of engineering decisions.
- Techniques for effective team presentations.

8	Module Learning Outcomes		
	On successful completion of the module, students will be able to:		
	1	Working in teams, interpret the impact of different design proposals on the optimisation of engineering solutions.	
	2	Identify the environmental and societal impact of civil engineering projects and discuss ways of minimising it.	
	3	Use design software to illustrate engineering solutions.	
	4	Explain the engineering processes followed and how key decisions are made.	

9	Module Assessment		
Learning Outcome Number (from table 8)	Coursework	Exam	In-Person
1-3	Design Report 70%		
4			Team Presentation 30%

10	Breakdown Learning and Teaching Activities		
Learning Activities	Hours	Details of Duration, Frequency and other comments	
Scheduled Learning (SL) includes lectures, practical classes and workshops as specified in timetable	48 hours	1hr x 12 lectures, 1hr x 12 project tutorial 2hr x 12 computer labs	
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE	20 hours	Work-based learning, peer and group learning.	
Private Study (PS) includes preparation for exams	132 hours	Coursework and in-person preparations.	
Total Study Hours:	200 hours		

11	Key Texts and Online Learning Resources
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Essential (Books/Journals/Specific chapters/Journal Articles):

Mannering, F.L., Kilareski, W.P., and Washburn, S.S. (2004). Principles of Highway Engineering and Traffic Analysis. Third Edition. John Wiley & Sons, Inc.

Wright, P. H., Dixon, K. K., and Meyer, M. (2004). Highway Engineering. Seventh Edition. John Wiley & Sons, Inc.

Larsen O.P., (2016). Conceptual Structural Design: Bridging the gap between architects and engineers, Second edition, ICE proceedings.

António J. Reis, José J. Oliveira Pedro, (2019). Bridge Design: Concepts and Analysis, WILEY.

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Module Summary Information

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1	Module Title	Civil Engineering Principles 1
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4126
5	Semester Taught	1

6	Module Overview
Civil Engineering is a discipline that covers wide range of subjects and knowledge, essential to solving real-world problems, such as climate change and the environment impact of infrastructure. This requires a solid understanding of a wide range of Civil Engineering areas such as fluid mechanics, engineering geology, sustainability, and the applied practices of civil engineering science. This module has been designed to enable you to learn the practical skills and techniques used in Civil Engineering science through laboratory experiments, report writing and problem-solving using analytical skills. You will also learn the fundamental mechanics of fluids and the engineering geology part of the module which provides fundamental knowledge on the origin and behaviour of geomaterials (soils and rocks). You will also have the opportunity to engage with the key aspect of sustainability in Civil Engineering which involves sustainable design and the Climate Emergency, which as a role of future engineers to address the current and future engineering challenges. Learning experience and activities incorporate the combination of lectures which deliver the theoretical background; seminar with interactive tutorial work; and laboratory experiments that enable hands-on practical and group work. Practical work within this module includes practical demonstrations, seminar, and tutorial work, problem-based scenarios and group work. The work is assessed via coursework and laboratory reports. This module enables you to acquire key practical and technical skills, with the sustainability concepts are embedded. You will be engaging with the core Civil Engineering subjects of hydraulics, geology and environmental engineering that help develop the identity of the course, prior to advancing to the next level of your studies.	

7	Indicative Content
In this module you will be covering the following topics: • Fluid mechanics • Conservation equations • Impact jet experiment • Origin of soils and rocks • Engineering properties of soils and rocks • Engineering classification of soils • The Climate Emergency and Civil Engineering's role in addressing it • Key areas of sustainability in Civil Engineering • Principles of sustainable Civil Engineering design	

8 Module Learning Outcomes		
On successful completion of the module, students will be able to:		
	1	Practise the main techniques used in civil engineering science, covering analysis, laboratory experiments, and report writing.
	2	Apply fluid mechanics analysis techniques in a laboratory context.
	3	Identify geomaterials properties using engineering geology concepts and laboratory experiments.
	4	Identify the key aspects of sustainability in Civil Engineering and discuss the discipline's importance to the Climate Emergency.

9 Module Assessment			
Learning Outcome Number	Coursework	Exam	In-Person
1-4	Portfolio 100%		

10 Breakdown Learning and Teaching Activities		
Learning Activities	Hours	Details of Duration, Frequency and other comments
Scheduled Learning (SL) includes lectures, practical classes and workshops as specified in timetable	48 hours	2hr x 12 lectures, 2hr x 9 seminars 2hr x 3 labs
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE	20 hours	Work-based learning, peer and group learning.
Private Study (PS) includes preparation for exams	132 hours	Coursework preparations.
Total Study Hours:	200 hours	

11 Key Texts and Online Learning Resources	
Essential (Books/Journals/Specific chapters/Journal Articles):	

Hibbeler, R. C., Yap, Kai Beng, ProQuest (2021). Fluid Mechanics, Second edition in SI units, global edition. Harlow, Essex: Pearson.

Hamill, Les (2011). Understanding Hydraulics, Third Edition, Palgrave Macmillan, Basingstoke.

Palwyn, M (2016). Biomimicry in Architecture, 2nd edition, RIBA Publishing.

Waltham, T. (2009). Foundations of Engineering Geology, 3rd Edition, Taylor & Francis Group.

Module Specification

Module Summary Information

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1	Module Title	Architectural Design Studio 1
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4134
5	Semester Taught	1

6	Module Overview
This module begins your journey into architectural design, building technical knowledge and developing design related skills. In this module, you will be given a project brief and your goal is to develop a comprehensive conceptual design that responds to the project brief. Learning the design process is one of the most important objectives of this module. The design process is a series of sequential design decisions taken informing an architectural response that addresses the project brief. As part of this module, you will work with a variety of industry-standard digital tools and technologies to produce conceptual drawings and presentations. Architectural Design Studio 1 is delivered through a series of workshops, tutorials, and studio-based teaching. The focus in this module is centred around the design aspects of the project. This module aims to help you practice the role of an architectural technologist through an industry-focused residential project. It is designed to enhance your critical thinking, decision-making, professional skills and creativity.	

7	Indicative Content
The topics covered in this module include: • Introduction to project life cycles and RIBA Plan of Work • Site investigation and analysis • Broader factors influencing the development and design process: politics, economics, social, contextual, and environmental • Advanced digital tools and technologies in architectural technology • Construction and architectural drawing production using a range of techniques • Architectural design process • Architectural design standards • Research for design and construction decision making • Architectural presentation techniques • Poster design • 3D Printing	

8	Module Learning Outcomes
On successful completion of the module, you will be able to:	
1	Recognise and apply the political, economic, societal, environmental, technological, legal, and regulatory frameworks that shape the design and use of buildings and structures in line with the project brief.

	2	Create an industry standard conceptual architectural design that aligns with RIBA Plan of Work Stage 2.
	3	Produce a structured record of research and decision-making in the form of a design diary throughout the design development.
	4	Professionally communicate conceptual designs in various formats to varied audiences.

9	Module Assessment		
Learning Outcome Number (from table 8)		Coursework	In-Person
1, 2, 3, 4		Portfolio 70%	Presentation 30%

10	Breakdown Learning and Teaching Activities		
Learning Activities		Hours	Details of Duration, Frequency and other comments
Scheduled Learning (SL) includes lectures, practical classes and workshops as specified in timetable		48	4hr Practical Studio Workshop x 12 (12 weeks in the Semester)
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE		24	2hr x12 Directed Learning which includes critical reading, online learning, Moodle material and peer learning.
Private Study (PS) includes preparation for exams		128	Weekly self-study 10hr x 12 in accordance with the workshop activities. 8hr additional preparation for the final submissions.
Total Study Hours:		200	

11	Key Texts and Online Learning Resources
Books:	
• Buxton, Pamela (2018) Metric handbook of planning and design (5th ed), Routledge • American Institute of Architects (2013) The Architects' Handbook (15th ed), Wiley • Neufert, Ernst; Neufert, Peter; Kister, Johannes (2012) Architects' Data (4th ed), Wiley-Blackwell	
Online Resources:	
• British standards (2021) Available at: https://ezproxy.bcu.ac.uk/login?url=https://bsol.bsigroup.com/ • Building regulations approval (2021) Available at: https://www.gov.uk/building-regulations-approval • Planning portal (2021) Available at: https://www.planningportal.co.uk/	

- Digimap (2021) Available at: <https://digimap.edina.ac.uk/>
- Digital Club Moodle Page

Architecture Blogs:

Dezeen, Available at: www.dezeen.com

Archdaily, Available at: www.archdaily.com

Archilovers, Available at: www.archilovers.com

Recommended:

- Greeno, R. (2012) Mitchell's Introduction to Building, Abingdon, Routledge.
- Allen, E. and J. Iano (2019). Fundamentals of building construction: materials and methods. Hoboken, New Jersey, Wiley.

Bell, V. B. and P. Rand (2014). Materials for design 2. New York, New York, Princeton Architectural Press.

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Module Summary Information

1	Module Title	Cost Management
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5106

5	Module Overview
This module is pivotal in the curriculum as the ability to understand the process and techniques appropriate in cost planning in accordance with professional codes of practice and the RICS core competences is a principal role of the QS. As cost managers within the construction industry, you will need to demonstrate the ability to achieve a depth of understanding of how construction projects are cost managed at design stage and valued through the use of internal and external sources of information and cost data. This allows development of technical skills to a level, which will enable in depth knowledge of how the cost estimating and cost planning structure of projects can be applied to cost advice for both new build and refurbishment works. This module aims to develop and enhance your knowledge and understanding of the application and thinking on construction economics' in relation to both new and existing building projects through a range of related topic areas from costing and design issues. This module will develop your skills in cost planning and preparation of cost estimate at design stage. You shall expect to acquire fundamental skills to estimate construction costs based on various levels of design information, make use of cost data from a variety of sources and appreciate the implications of risk and design economics on the cost and value of different types of building works. The assessment will enable you to be reflective in your advice, and practice will develop your problem solving, analysis and investigation skills.	

6	Indicative Content
• Building cost management process • Early cost estimating measurement standard • Various estimating methods • Elemental cost planning • Cost analysis and benchmarking • Use of indices • Design economics • Cost reporting • Use of software for cost management	

7 Module Learning Outcomes		
On successful completion of the module, students will be able to:		
	1	Identify the information requirements for cost planning function at various RIBA work stages and their relationship to the early estimating approaches and the choice of costing techniques.
	2	Critically analyse information obtained through research providing graphical and data analysis required for early cost advice, prepare cost estimate and make recommendations to clients.
	3	Compare the relationship between cost, shape and size of projects and sites specifics and be able to advise and guide other members of the design team appropriately, in the framework of the existing UK economy.
	4	Assess the impact and implications on early cost advice of developing existing buildings when introducing modern construction techniques within an existing structure.

8 Module Assessment			
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		

9 Breakdown Learning and Teaching Activities	
Learning Activities	Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	80
Private Study (PS) includes preparation for exams	72
Total Study Hours:	200

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Module Summary Information

1	Module Title	Building Pathology
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5110
5	Semester Taught	S1

6	Module Overview
The module covers the basic requirements for property professionals engaged with the existing built environment to appreciate varying needs to clients in relation to property, to identify methods of construction, appraise the condition of a building, and make recommendations to achieve client's aims. The module is designed to give you the opportunity for practical application of your learning to a relevant case study. For the building surveying programme this module relates to 3 of the 6 key competencies of the RICS Building Surveying pathway: Building Pathology, Inspection and Measurement of land and property. For the real estate programme this module relates to 2 of the core competencies: Inspection and Measurement of land and property, as well as the optional competency of Building pathology. For the Planning and Property Development programme this module broadens your knowledge of the existing environment which, in terms of sustainability, needs to be altered and adapted to provide for economic reuse rather than wholesale regeneration and new build. Consequently, you are better able to survey and appraise options for reuse including issues relating to resources and financial viability. This module is delivered to BSc (Hons) Building Surveying, BSc (Hons) Real Estate and BSc (Hons) Property, Development and Planning at Level 5.	

7	Indicative Content
Survey Types: • Building Survey • Condition Survey • Homebuyers Survey • Valuation. Defects: • Roofing • Walls • Foundations • Windows and Doors • Internal Components • Services • Timber Defects • Diagnosis of Damp • Cracking in Buildings	

- Assessing the Age of a Building

Report Writing.

- Following RICS guidance notes for undertaking surveys, data collection, storage and analysis

Professional requirements

- Understanding and applying RICS code of conduct, rules and ethical behaviour in respect of taking instructions, client care, conflict of interest, confidentiality, treating people with respect, honesty and integrity etc.

Health and Safety

- Following the RICS guidance surveying safely
- Lone working policies

Risk assessment

8		Module Learning Outcomes
		On successful completion of the module, you will be able to:
	1	Evaluate the materials and methods of construction of existing residential and simple commercial buildings.
	2	Appraise common defects, including methods of identification, causes and remedies.
	3	Apply the professional requirements of undertaking surveys and collection of data.
	4	Evaluate the client's requirements and produce a formal professional quality survey report including relevant advice.

9	Module Assessment		
Learning Outcome Number (from table 8)	Coursework	Exam	In-Person
1 - 4	x		

10 Breakdown Learning and Teaching Activities		
Learning Activities	Hours	Details of Duration, Frequency and other comments
Scheduled Learning (SL) includes lectures, practical classes and workshops as specified in timetable	48	2hr lecture x12, 2hr seminar x12
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE	60	Directed learning to include researching appropriate professional bodies and academic literature etc.
Private Study (PS) includes preparation for exams	92	Research activities to support assessments
Total Study Hours:	200	

11 Key Texts and Online Learning Resources
Purchase There is no single recommended purchase, but you should consider purchasing ONE from the 'essential' list below, dependent on your preferred learning style. Essential - Douglas, J. and Ransom, W. (2013) <i>Understanding Building Failure</i>, Routledge, Abingdon. - Glover, P. (2013) <i>Building Surveys</i>, Routledge, Abingdon. - Hollis, M. (2010) <i>Surveying buildings</i>, 5th Ed. RICS, London. - Hollis, M. (2006) <i>Pocket surveying buildings</i>. RICS, London. - Marshall, D., Worthing, D., Heath, R. and Dann, N. (2013) <i>Understanding Housing Defects</i>, Routledge, Abingdon. In addition you will need to regularly access the following web resources: http://www.isurv.com/ and Construction Information service https://www.ihssso.com/CIS Recommended Douglas, J. and Noy, E. (2011) <i>Building Surveys and Reports</i>, Wiley-Blackwell, Oxford. Hinks, J. and Cook, G. (1997) <i>The Technology of Building Defects</i>, Routledge, London. You should look at the new journal <i>International Journal of Building Pathology and Adaptation</i>

Trade Press

Building Surveying Journal, RICS
Modus – the magazine of the RICS

In addition use of the following professional bodies' websites would be useful.

RICS - <http://www.rics.org/uk/>

CIOB - <http://www.ciob.org/>

Background

You will be directed towards any background readings / materials.

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Module Summary Information

1	Module Title	Design and Development in the Built and Natural Environment.
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5112

5	Module Overview
This module critically discusses and applies the socio-economic, historical, environmental and governance context that shapes the design and use of buildings and structures to a real life development project. We encourage and support you to develop and apply a range of research techniques to evaluate design, costs, benefits and values of 'good' design; how to appraise the implications of different approaches to implementation, on-going use, management and quality of place; and produce a practice-based piece of work delivering a range of benefits to different users and communities. The module is therefore relevant to all of the professions active in creating managing the built environment.	

6	Indicative Content
You will cover a range of topics in this module including: Socio-economic factors affecting development. Responding to client brief in the context of broader environments and requirements. The role of governance in the design, development and use of buildings and structures. The impact of costs, benefits and value on good design. Different approaches to the planning, designing and valuing of development projects. All through the production of an industry standard solution to a real world problem.	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
	1 Critically debate and apply the socio-economic, historical, environmental and governance context that shapes the design and use of buildings and structures.
	2 Examine and employ good practice in the costs, benefits and value of 'good' design, and how this influences the use of buildings, structures and spaces.
	3 Appraise the implications of different approaches to implementation, on-going use, management and quality of place.
	4 Evaluate the significance of key planning, design and implementation influences affecting development.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		

9	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	72	
Private Study (PS) includes preparation for exams	80	
Total Study Hours:	200	

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Module Summary Information

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1	Module Title	Property Law
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5116
5	Semester Taught	1

6	Module Overview
This module introduces you to the nature of real property and the legal framework that regulates its acquisition, disposal, use, occupation and management. Much of what is covered is designed to relate to issues that may be met in professional practice and explain the way in which the law will impact your upon day-to-day activities and decisions. Problem-based study aims to develop general competencies based on the kinds of abilities and skills required of a professional practitioner. Professional work involves the application of knowledge within a specific situation; teaching is often via workshops which therefore provide a context in which problems can be understood and appropriate solutions devised. By devising solutions to these problems, you will learn to use the knowledge which has been obtained in pursuance of these objectives.	

7	Indicative Content
The module will cover content such as the meaning of land and estates and interests that may be owned; third party rights that affect the development and use and occupation of land; the acquisition process including funding; the planning and compulsory purchase processes, including limitations on planning consents, enforcement of planning legislation; and the impact of rent reviews and lease renewal in business tenancies.	

8	Module Learning Outcomes
On successful completion of the module, you will be able to:	
1	Explain the legal nature of real property and the third-party rights and regulations that influence the development, use, occupation and value of land.
2	Assess the interaction between common law and statute law as it relates to real property and the impact it has on the development, use and occupation of land.
3	Identify and assess the impact of law relating to rent reviews and lease renewal in business tenancies.
4	Identify and assess the compensation for compulsory purchase and adverse planning decisions.

9	Module Assessment		
Learning Outcome Number (from table 8)	Coursework	Exam	In-Person
1 and 4	Essay 50%	N/A	N/A
2 and 3	Essay 50%	N/A	N/A

10 Breakdown Learning and Teaching Activities		
Learning Activities	Hours	Details of Duration, Frequency and other comments
Scheduled Learning (SL) includes lectures, practical classes and workshops as specified in timetable	48	12 x 2 hour lecture 12 x 2 hour seminar
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE	72	As directed in the seminar
Private Study (PS) includes preparation for exams	80	As directed by the module team
Total Study Hours:	200	

11 Key Texts and Online Learning Resources	
Card, Card and Murdoch Real Estate Management Law West Law online resource Resources located in topic areas on the VLE	

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Module Summary Information

1	Module Title	Civil Engineering
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5118

5	Module Overview
This module has been designed to enable you to use problem-based learning to understand the Technology of Civil Engineering and innovation now being applied by Construction Managers. You will expand your skills in interpreting information about project sites and you will develop a wider understanding of operational and constructional processes. Within the module you will be introduced to key aspects of Civil Engineering: Soil and site investigation: ascertaining composition of sub-soils, groundwater levels, properties of substrata. Methods for site investigation: site visit, measurements, photographs, archive searches in local authority records. Methods for soil investigation: trial pits, trenches, hand augers, drilling of boreholes. Testing of soil samples (on site and at laboratories). Case studies of Proposed developments and associated external works. Interpretation of Site report: location map, site history, adjacent properties. Access, utilities, streams (above and below ground), groundwater level, soil properties from borehole logs. Interpreting and providing recommendations Groundworks: site clearance, site preparation, groundwater control, excavation for foundations, safe load distribution, differential settlement, seasonal movement, sulphates in soil water, foundation areas and depths for pad foundations in mass and reinforced concrete, balanced foundations, trench support, props, ground pressures for various soils, angle of internal friction, water table, surcharge, triangles of pressure, resultant pressures. Effects of ground movement, trench collapse, fracture of utilities, hazards during construction. Main structural elements: beams and columns in steel, timber and reinforced concrete, shuttering reinforced concrete, fixing of reinforcement, concrete curing and striking formwork; steel connections, bracing, fireproofing, bracing, water exclusion (rain, groundwater), moisture movement. Structural behaviour and analysis: compression, tension, bending, deflection; effects of loads (dead, live, wind) External works: roads, drainage systems, SUDS, culverts, gravity and cantilever retaining walls. Structural calculations of stability against sliding and overturning. The module follows the Construction Management programme philosophy of developing students' intellectual and practical competence in technical, managerial, economic, theoretical and environmental aspects of construction. Similarly the learning and teaching philosophy incorporates learning through formal lectures including presentations, seminars, tutorials, and problem based scenarios, backed up by visits to construction sites and exhibitions when appropriate. Learning is practice-based, knowledge applied, work related learning, incorporating international perspectives of	

the processes.

6 Indicative Content

This module is in recognition of the fact that Construction Managers can work on civil engineering projects in their careers, so it provides a broad overview of the technology of civil engineering. In addition it includes some structural calculations, which is useful not only to understand the importance of the sizes of structural elements, but more importantly that construction companies have to design their own Temporary Works. Finally it will cover some details of external works, which are all the elements of a development which are outside the building including roads, drainage and hard landscaping.

7 Module Learning Outcomes

On successful completion of the module, students will be able to:

- | | |
|---|---|
| 1 | Analyse the methods and purposes of site and soil investigations. |
| 2 | Analyse and examine commercial foundations, retaining walls and trench supports, groundworks and temporary works. |
| 3 | Calculate the performance of the superstructure and the structural behaviour of the main elements. |
| 4 | Appraise the influences on the design and construction of external works. |

8 Module Assessment

Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		

9 Breakdown Learning and Teaching Activities

Learning Activities	Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	52
Private Study (PS) includes preparation for exams	100
Total Study Hours:	200

Module Specification

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Module Summary Information

1	Module Title	Procurement
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5119

5	Module Overview
In this module you will cover core areas required in designing and setting up a contract. It is designed to give you an understanding of the procurement process and how it can deliver on a range of benefits to clients, contractors and other stakeholders involved with the development process. During the module, you are required to develop your knowledge on issues that affect the choice of a procurement strategy by evaluating various projects and the best management and procurement approaches to be adopted. You will also learn about how the choice of procurement strategy will impact on time, cost, viability, quality and sustainability issues. Current issues influencing procurement, such as international markets, legislation and sustainable procurement, will also be covered. The module encourages you to critically reflect on what might be considered the best service to the client; this involves understanding and evaluating which procurement approach will lead to the best outcome based on the nature of the project. The ability to understand the procurement options in accordance with professional codes of practice and core competences required by the RICS/CIOB are core skills for a professional working in the construction / development industries. During the assessment process, you will also develop your communication skills and problem solving skills in providing professional advice to your client.	

6	Indicative Content
The module covers procurement approaches used in setting up construction contracts and the impacts of the different approaches on project delivery and success. The topics covered include: - Understanding clients and their needs. - Understanding of procurement methods. - Traditional procurement route. - Design and build procurement. - Management contracting and construction management. - Two stage Procurement. - IPI procurement. - New Engineering Contracts and partnering. - Tendering. - Sustainable procurement approaches. - Impact of Building information modelling on procurement. - European procurement requirements and frameworks. - Standard forms of contract.	

7	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Evaluate modern methods of procurement and their application in a built environment context.
	2	Select and evaluate an appropriate method of procurement for any given built environment scenario.
	3	Analyse the strengths and weaknesses of tender and contract documentation required for different procurement methods.
	4	Analyse the potential time, cost, quality and sustainability benefits associated with procurement in a built environment context.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		

9	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	62	
Private Study (PS) includes preparation for exams	90	
Total Study Hours:	200	

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Module Summary Information

1	Module Title	Soil Mechanics
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5123
5	Semester taught	1

6	Module Overview
In accordance with the programme philosophy and aims, this module has been designed to enable you to use problem-based learning to understand the main features of geomaterials and the importance of soil mechanics in Civil Engineering. This set of information is fundamental for planning site investigation operations and carrying out geotechnical design. The module includes opportunities to complete laboratory tests to define the main design parameters of soils. The module follows the Civil Engineering programme philosophy of developing your intellectual and practical competence in technical, theoretical and environmental aspects of civil engineering. Similarly, the learning and teaching philosophy incorporates learning through formal lectures including, seminars, tutorials, laboratory tests and problem based scenarios. Learning is practice-based, knowledge applied and work-related including project-based activities. This module covers the basic characterisation of soils including composition, classification, effective stress, permeability, consolidation, compressibility and shear strength. The core principles of soil mechanics are also applicable to other granular materials that are often used in other civil engineering applications. Learning activities will incorporate formative assessment including work-related learning and problem solving, in-class tasks, seminar work and laboratory work. The assessment outline section below details assessment for this module by way of examination. Practical work within this module includes practical demonstrations, seminars, laboratory and tutorial work, use of ICT as a visual tool and group project work.	

7	Indicative Content
1. Apply the main concepts of engineering geology to identify and classify samples of geomaterials taking into account sustainability aspects. - Fundamentals of engineering geology. 2. Analyse the behaviour and response of soils through laboratory tests to determine their physical and mechanical properties. - Physical characterisation of soils. - Effective stress. - Seepage. - Soil compaction. - Shearing behaviour of soils.	

3. Evaluate the response of soils under loads and displacements, using the concepts of effective stress and consolidation.

- Effective stress.
- Seepage.
- Compression behaviour of soils.
- Shearing behaviour of soils.

4. Calculate geotechnical design parameters using shear strength and compressibility laboratory test results.

- Effective stress.
- Compression behaviour of soils.
- Shearing behaviour of soils.

8	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Apply the main concepts of engineering geology to identify and classify samples of geomaterials taking into account sustainability aspects.
	2	Analyse the behaviour and response of soils through laboratory tests to determine their physical and mechanical properties.
	3	Evaluate the response of soils under loads and displacements, using the concepts of effective stress and consolidation.
	4	Calculate geotechnical design parameters using shear strength and compressibility laboratory test results.

9	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X (50%)	X (50%)	

10	Breakdown Learning and Teaching Activities		
Learning Activities	Hours	Details of Duration, Frequency and other comments	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48	8 x 2h lecture 8 x 2h seminar 4 x 4h practical (laboratory)	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	24	12 x 2h directed Learning which includes critical reading, online learning, Moodle material and peer learning.	
Private Study (PS) includes preparation for exams	128	12 x 8h self-study 1 x 32h additional preparation for the exam	
Total Study Hours:	200		

11	Key Texts and Online Learning Resources
	Purchase None Essential (Books/Journals/Specific chapters/Journal Articles) Knappett, J. and Craig, C.F. (2020) – <i>Craig’s Soil Mechanics</i>. 9th Edition. CRC Press. Powrie, W. (2014). - <i>Soil Mechanics: Concepts and Applications</i>. 3rd Edition. E & F N Spon. Recommended Barnes, G. (2000) – <i>Soil mechanics Principles and Practice</i> 2nd Edition. Macmillan Press. Bell, F.G. (2007) – <i>Engineering Geology</i>. 2nd Edition. Butterworth-Heinemann. Waltham, T. (2009). <i>Foundations of Engineering Geology</i>. 3rd Edition. Taylor & Francis Group Background None

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Module Summary Information

1	Module Title	Structures 1
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5124
5	Semester Taught	1

6	Module Overview
This module has been designed to enable you to use problem-based learning to understand the core principles of structural analysis as relating to buildings and other structures. This module follows the Civil Engineering programme philosophy of developing the intellectual and practical competence in technical, economic and theoretical aspects of civil engineering. Similarly, the learning and teaching philosophy incorporates learning through formal lectures including presentations, seminars, tutorials and problem-based scenarios, backed up by visits to construction sites and exhibitions when appropriate. Learning activities incorporate formative assessment including problem solving, in-class tasks, and seminar work. The assessment outline section below details assessment for this module by way of end examinations and coursework. Practical work within this module includes use of ICT as a visual tool, problem-based scenarios and group work. You are encouraged to plan your own work schedules and manage your time.	

7	Indicative Content
In this module you will be covering the following topics: • Approximation of structural loading due to permanent and variable loads and load combinations. • Structural Analysis of determinate structures. • Trusses. • N, V, M diagrams for frames. • Deflections • Optimized design of steel beams. • Optimized design of steel beams. • Influence lines for reactions on supports. • Influence lines for internal loading. • Combinations of moving loads. • Analysis of statically indeterminate structures with the force method. • Analysis of statically indeterminate structures with the moment distribution method.	

8	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Calculate the effects of structural input data on members, trusses, and frames, using force and moment diagrams.
	2	Digitally analyse a structure taking into account loading, environmental, sustainability and optimisation aspects.
	3	Appraise the effects of moving loads on structures using influence lines.
	4	Analyse statically indeterminate structures using elastic analysis including implications of redundancy.

9	Module Assessment		
Learning Outcome		Coursework	Exam
1-2		30%	
1,3-4			70%

10	Breakdown Learning and Teaching Activities	
Learning Activities		Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable		48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE		56
Private Study (PS) includes preparation for exams		96
Total Study Hours:		200

11	Key Texts and Online Learning Resources
Essential (Books/Journals/Specific chapters/Journal Articles):	
Hibbeler, R. C. (2017). Structural analysis, Boston: Pearson.	

Cirulis, M., & Wicks, P. (2015). Structural analysis, London: ICE Publishing.

Recommended:

McKenzie, W. M. C. (2014). Examples in structural analysis: Boca Raton, CRC Pres.

Bauchau O. A., & Craig J. I. (2009). Structural Analysis, Springer.

Module Specification

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Module Summary Information

1	Module Title	Design Practice
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5125

5	Module Overview
This module develops your ability to assess the needs of clients. It provides a broad based study of Architectural Technology (AT) and Building Surveying (BS); combining the personal qualities of observation, analysis, judgement and their ability to communicate effectively using appropriate technical language and drawings associated with professional practice. You will develop an understanding of how decisions regarding technology, materials and design impact on the environment and the whole life cycle of a building. This will include an examination of design solutions for new build projects and for the alteration, adaptation, and extension of an existing building, and the project procurement process (administration of contracts, cost and quality control). Your ability to respond to the practical challenges presented by rapidly evolving technological, regulatory, social and economic demands, as they apply to both proposed and existing developments, will also be challenged.	

6	Indicative Content
Client requirements and development briefing. Evaluation of development site/buildings. Technical information and development factors. Resources and environmental impact. Regulatory framework. Health, Safety and Welfare legislation. Detailed design and specification. Life cycle and whole life cost considerations. RIBA Plan of Work. Team roles and responsibilities, collaborative working and communication. Construction project procurement, contracts and administration. Professional and ethical practice.	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
1	Identify the processes and systems included in a typical UK construction project from strategic definition through to in use and categorise these within the RIBA Plan of Work.
2	Illustrate design skills and demonstrate awareness of design principles and methods.

	3	Analyse the commonly used construction project procurement routes and contracts and prescribe their appropriate use for given project scenarios.
	4	Appraise professional, legal and ethical duties and liabilities associated with professional design practice.

8	Module Assessment		
Learning Outcome		Coursework	Exam
1-4		X	

9	Breakdown Learning and Teaching Activities	
Learning Activities		Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable		48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE		24
Private Study (PS) includes preparation for exams		128
Total Study Hours:		200

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Module Summary Information

1	Module Title	Built Environment Technology 2
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5128

5	Module Overview
This module builds on your foundation of knowledge gained around residential technology in the Built Environment Technology 1 module at Level 4 (or any other accepted prior learning) and develops your understanding of commercial construction techniques and methods, it will also provide you with an understanding of modern and sustainable methods of commercial construction. Relevant Building Regulation, Health Safety and Welfare legislation will also be reviewed concurrently. In particular, you will be introduced to everyday materials, construction methods and building services. You will gain an insight into the properties of materials and the basic scientific principles that apply to them. Individually you will work on an existing virtual commercial building model enabling an appreciation of the role of the designer and an understanding of the design process.	

6	Indicative Content
Commercial and Industrial building solutions: e.g. high rise, long span. Fire engineering. Substructure: foundations, basements and ground floors. Superstructure: building frames, upper floors, roofs, curtain wall and cladding systems. Access and circulation: mechanical transportation (lifts, escalators and travelators). Stairways, partitions and internal doors, raised access floors, and ceiling systems. Finishes. Building services and equipment: mechanical engineering, electrical engineering and public health engineering. Building Information Modelling (BIM). Sustainable solutions: national and international building performance assessment methods. Case studies.	

7	Module Learning Outcomes		
	On successful completion of the module, students will be able to:		
	1	Effectively utilise the terminology used in the construction of framed commercial buildings including the evolution of current technologies from former technologies.	
	2	Apply knowledge of the different construction materials and how they are combined in buildings; structure, fabric, components and finishes.	
	3	Apply common UK and international performance requirements of buildings and building elements and emerging technologies inform technical innovation and development of new materials.	
	4	Apply the principal legislation and regulations that affect commercial technology and their influence on new environmental technologies.	

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		

9	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	24	
Private Study (PS) includes preparation for exams	128	
Total Study Hours:	200	

Module Specification

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Module Summary Information

1	Module Title	Built Environment Commercial Technology
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5129

5	Module Overview
This module will explore the wider implications of the key factors which affect the selection of both traditional and new building methods and materials used in the construction of new build commercial and industrial buildings and introduce environmental and mechanical services systems which need to be installed in these buildings. In particular you will gain an insight into the operational complexities involved in the construction of large-scale commercial and industrial buildings to ensure that projects are delivered in time and on budget to meet the required standard of quality. You will be introduced to the key technology concepts to develop understanding of the technical terminology used in commercial construction. Individually, the module provides in-depth understanding of the construction methods and systems which can be applied to meet varying commercial and industrial building types and to apply the technology principles gained at Level 4 to large scale buildings. Application of learning will be through problem-based tasks to identify different building material and methods which can be used in commercial construction. You will also be introduced to environmental and mechanical services systems which you need to identify, compare and contrast in order to make a well informed decision about the most appropriate system to select which should be based on efficiency, operation, performance requirements and cost effectiveness. The problem-based tasks will be facilitated by case studies, research, direct questioning and reflective learning. A formative assessment will be provided, as a feed-forward tool, at different point of the module progression to underpin and consolidate your understanding. Resources for learning, teaching and assessment will all be available on the university virtual learning environment (VLE), Moodle.	

6	Indicative Content
The module introduces the student to the methods and techniques that are required in the construction of commercial and industrial buildings with particular emphasis on building substructure and superstructure. Topic areas include:- 1. Factors affecting the design and construction of industrial and commercial buildings (function, structure, regulatory, legal and cost). 2. Materials and processes used in the construction of industrial and commercial buildings.	

3. High rise commercial and office buildings (short and medium span frames).
4. Low rise industrial and warehouses (Long span frames).
5. External walls and cladding.
6. Upper floors and roofs.
7. Health and safety risks/accidents associated with construction of commercial and industrial buildings.
8. Fire Engineering design for commercial and industrial buildings.
9. Commercial services-Cold and hot water supply and distribution systems.
10. Commercial services- Mechanical Ventilation.
11. Commercial Services- Electrical Distribution Systems.
12. Commercial services- Vertical Movement (lifts and escalators).
13. Commercial Services- Plumbing and Drainage Systems.

7	Module Learning Outcomes		
	On successful completion of the module, students will be able to:		
	1	Employ appropriate terminology, regulation and guidance influencing the design of large scale buildings.	
	2	Compare and contrast both traditional and new innovative materials and concepts in the construction of large scale buildings.	
	3	Identify, employing illustrations, performance requirements of floors, walls, and facade finishes to the construction of commercial buildings and recognise how these requirements can inform technical innovation and development of new construction materials.	
	4	Recognise the principal legislation and regulation that affect commercial and industrial buildings and their influences on environmental and mechanical services systems and formulate solutions to satisfy the performance requirements of these buildings sustainably.	

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		

9	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48 You will be set a series of basic and complex problem-based class tasks, you will be expected to complete these tasks within the class and in your own time as directed by the Module leader. These will be an effective learning tool to enhance and consolidate your conceptual understanding of commercial technology by applying theory to practical scenarios incorporating both traditional and new eco-friendly building materials and innovative environmental technology to meet the current requirements of Building Regulation.	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line	52	

activity, Graduate+, peer learning, as directed on VLE	You will be expected to continually work on your individual coursework which include 4 critical reflection mini-reports 750 words each to be uploaded to Moodle as shown on Assessment Schedule below. Each aligned to the class tasks set so you so your attendance and active participation will be critical to the successful completion of the tasks. You have to methodically review and apply what you have learnt during the lecture, seminar and site visit to make a well informed decision about the most appropriate solution to the problem-based tasks. You should engage using Moodle and other resources provided in the module documentation and expand into other self-selected resources as appropriate.
Private Study (PS) includes preparation for exams	100 You should use the time given in Private Study to research reflect and consolidate you understanding of commercial construction methods materials and innovative services technology by accessing Trade Literature and construction web sites, research current technology and actively incorporate your reflective analysis.
Total Study Hours:	200

Module Specification

Module Summary Information

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1	Module Title	Technological Design Studio 1
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5150
5	Semester Taught	S1

6	Module Overview
This practical module is focused on designing an industry-standard commercial building. In this module, you will work towards addressing the requirements of an industry-focused commercial project. Following a creative and logical design process, you will analyse site features and precedents and incorporate influential parameters (economic, social, contextual, environmental, and legal) to shape a design proposal. Your design ideas should incorporate building technology aspects such as building performance, sustainability, building structure, building systems and services, and construction materials. One of the most important elements of this module is the application of Building Information Modelling to produce technological design output following UK BIM standards and RIBA Plan of Work Stage 4. The module will allow you to practice the skills to create, manage and extract building data from a digital model. Technological Design Studio 1 is delivered through a series of workshops, inspirational lectures, and studio-based teaching. The focus in this module is centred around the design aspects of the project. Throughout this module, you will use various Industry-standard and cutting-edge digital tools and technologies in the built environment and architectural technology to produce high-quality technical drawings. You will also use a variety of presentation techniques to communicate your design and technology ideas to a broader audience. The module will allow you to practice the role of an Architectural Technologist in an industry-focused design project.	

7	Indicative Content
The topics covered in this module include: • Site investigation and analysis • The architectural and technological design processes and decision-making • Architectural design standards • Building Information Modelling (BIM) • Industry-standard and cutting-edge digital tools and technologies in the built environment and architectural technology • Industry-standard construction drawings using a range of techniques. • Sustainable architecture • Architectural presentation • Poster design • 3D Printing	

8	Module Learning Outcomes		
	On successful completion of the module, you will be able to:		
	1	Employ Building Information Modelling (BIM) and digital applications in designing a 3D BIM model of a commercial building.	
	2	Produce 2D technical drawings and 3D models of a commercial building based on RIBA Plan of Work Stages 2 and 3.	
	3	Apply critical thinking to incorporate broader factors influencing technological design in a commercial project.	
	4	Demonstrate professional concept design presentation skills to client audience using various tools and techniques.	

9	Module Assessment		
Learning Outcome Number <i>(from table 8)</i>	Coursework	Exam	In-Person
1, 2, 3	Portfolio 70%		
1, 3, 4			Presentation 30%

10	Breakdown Learning and Teaching Activities		
Learning Activities	Hours	Details of Duration, Frequency and other comments	
Scheduled Learning (SL) includes lectures, practical classes and workshops as specified in timetable	48	4hr Practical Studio Workshop x 12 (12 weeks in Semester 1)	
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE	24	2hr x12 Directed Learning which includes critical reading, online learning, Moodle material and peer learning.	
Private Study (PS) includes preparation for exams	128	Weekly self-study 10hr x 12 in accordance with the workshop activities. 8hr additional preparation for the final submission.	
Total Study Hours:	200		

11	Key Texts and Online Learning Resources
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Key Books:

- Buxton, Pamela (2018) Metric handbook of planning and design (5th ed), Routledge
- American Institute of Architects (2013) The Architects' Handbook (15th ed), Wiley
- Neufert, Ernst; Neufert, Peter; Kister, Johannes (2012) Architects' Data (4th ed), Wiley-Blackwell
- Walshaw, Emma (2017). Understanding architectural details: residential. United Kingdom, First in Architecture.
- Greeno, R. (2012) Mitchell's Introduction to Building, Abingdon, Routledge.

Online Resources:

- UK BIM Framework <https://www.ukbimframework.org/standards-guidance/>
- UK BIM Alliance <https://www.ukbimalliance.org/>
- British standards (2021) available at: <https://ezproxy.bcu.ac.uk/login?url=https://bsol.bsigroup.com/>
- Building regulations approval (2021) available at: <https://www.gov.uk/building-regulations-approval>
- Planning portal (2021) available at: <https://www.planningportal.co.uk/>
- Health and safety regulations (2021) available at: [Workplace health, safety and welfare. Approved Code of Practice and guidance L24 \(bcu.ac.uk\)](#)
- Digital Club Moodle Page

Recommended:

- Sawhney, Anil; Riley, Michael; Irizarry, Javier (2020). Construction 4.0: an innovation platform for the built environment. London;New York, Routledge.
- Allen, E. and J. Iano (2019). Fundamentals of building construction: materials and methods. Hoboken, New Jersey, Wiley.
- Bell, V. B. and P. Rand (2014). Materials for design 2. New York, New York, Princeton Architectural Press.

Module Specification

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Module Summary Information

1	Module Title	Project Management
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6120

5	Module Overview
This module will provide you a critical perspective on the nature, and a number of essential aspects of construction projects together with the approaches and techniques to manage them. The module will establish construction projects as an organisational entity, and highlight the two main approaches to the management of projects. The first one is the functional management approach which is largely based on structured techniques and methods, and the second one is the organisational management approach which sees management as an ongoing social and organisational process. You will be introduced to both approaches, and shown how to use them in a balanced way for the successful management of construction projects. While the organisational management approach to project management will provide you the intellectual skills that you need for project management, the functional management approach will equip you with the technical skills. Learning about the first approach (i.e. functional management approach) you will understand how to define the project in a structured way using project breakdown structures, and how to use these for further planning and control functions in the project. Learning about the second approach (i.e. organisational management approach) you will appreciate the fundamental difficulties of managing construction projects due to their inherent uncertainty and complexity. Therefore you will also appreciate the need for a multiplicity of management perspectives that you need to employ simultaneously for the successful management of projects. The content of the module will be delivered around these management perspectives which are typical to contemporary construction project management covering both of the aforementioned approaches. The assessment will enable you to practice the functional management techniques that you have learned (i.e. Coursework 1) as well as to critically use the organisational management perspectives that you have learned (i.e. Coursework 2). This module also offers an alternative assessment strategy for those engaging in a relevant study abroad programme or those who successfully completed a placement year, at the end of level 5 who actively participated within a project management capacity.	

6	Indicative Content
This module provides introduction to construction project management aspects. It will be assessed via two connected assessments. Topic areas includes: 1. Integrated project delivery and collaborative practices. 2. Construction scheduling, programming, earned value analysis and cash flow. 3. Project Risk and value management. 4. Health and safety in construction, Risk identifications and corporate responsibilities. 5. 6. Stakeholder engagement. 7. Sustainability and building performance. 8. People management. 9. Project culture and leadership. 10. Project management: international perspective 11. Management of Time, Cost & Quality	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
1	Demonstrate through application the use, interpretation and management of standard project planning, programming and control tools and techniques.
2	Develop an understanding of and appraise a selection of complex operational and financial uncertainties on projects and evaluate strategies for measuring and managing performance.
3	Critically analyse the role and importance of a project manager within both an organisation and a construction project.
4	Evaluate various project management methods and strategies, which need to be simultaneously applied in the management of stakeholders, the project team and people in construction projects.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-3	X		

9 Breakdown Learning and Teaching Activities	
Learning Activities	Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48 You will undertake a patched coursework which include two parts as shown in the Assessment Schedule below to demonstrate both an understanding of project management methods and the relationship between theoretical position and construction project management practices. You need to apply critical thinking and problem solving skills in addressing the issues at hand and articulate a plausible and well-argued through approach to address the key questions raised by both coursework.
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	80 You should use the time given in Directed Learning research reflect and consolidate you understanding of project management methods and principles and be able to explore new innovative methods by accessing both professional bodies and construction companies and learn from the current development and technologies used to enhance the delivery of construction projects for a wide range large scale building types using relevant construction management web sites, research current construction management methods and processes and actively incorporate your reflective and critical analysis to address the key issues raised by the 2 coursework.
Private Study (PS) includes preparation for exams	72 You should use the time given in Private Study to research reflect and consolidate you understanding of both functional and organisational management approach using construction web sites, research current construction project management techniques and actively incorporate your reflective analysis as integral part of the coursework.
Total Study Hours:	200

Module Specification

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Module Summary Information

1	Module Title	Applied Valuation
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6123

5	Module Overview
Valuation is central to the work of the professional real estate surveyor. Valuation expertise is used in a wide range of real estate contexts including investment, asset management, property development and maintenance management. This module is designed to further develop your valuation knowledge and skills and build on your previous learning in the Level 4 and Level 5 valuation modules. The module presents a series of true to life applications and encourages you to consider the wide range of purposes behind valuations. This module aims to provide you with the necessary knowledge, skills and expertise to facilitate your development into a leading real estate professional.	

6	Indicative Content
In this module you will cover the following topics: Regulations and professionalism Multi-tenanted investment Valuation of profit making entities Specialist valuations The valuation of: petrol filling stations; nursing homes; hotels; pubs; agricultural holdings Valuations for tax, insurance and accounting purposes	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
1	Critically appraise current valuation theory, principles and practice.
2	Evaluate and apply methods and techniques of valuation in relations to various property types and for a range of purposes.
3	Assess methods of valuation for taxation and evaluate its impact on business decisions.
4	Assess the importance of professionalism, independence and objectivity to valuation.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		

9	Breakdown Learning and Teaching Activities	
Learning Activities		Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable		48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE		72
Private Study (PS) includes preparation for exams		80
Total Study Hours:		200

Module Specification

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Module Summary Information

1	Module Title	Drivers of Change
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6124

5	Module Overview
This module introduces you to a range of the contemporary debates on the interrelationship between society stakeholders, space, technology and energy, and the environment and quality of life of different places at different spatial scales. Property developers and planners need an appreciation of contemporary drivers of social, economic and environmental change, if they are to influence and make effective decisions. In particular, the module critically examines how 'green' innovation, development, technology and design can contribute to the creation and maintenance of high quality places. Drawing on a range of international and UK-based case studies, the module encourages you to explore and debate a number of these issues from a range of different (and sometimes competing) perspectives.	

6	Indicative Content
This module will cover relevant issues for planning and development, which are potential drivers of change. These include issues such as sustainable development, climate change, energy, food, economics, migration, public health, water, transport, automation and new ways of living sustainably.	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
	1 Assess the major drivers of social, economic and environmental change within a property development and planning context.
	2 Select appropriate analytical frameworks to analyse case study examples.
	3 Evaluate the principles of sustainability within a variety of contexts.
	4 Critically appraise a topic / theme likely to influence future resource management, property development and planning decisions.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-2, 4	X		
3-4			X

9	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	76	
Private Study (PS) includes preparation for exams	76	
Total Study Hours:	200	

Module Specification

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Module Summary Information

1	Module Title	Property Fund Management
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6126

5	Module Overview
Property fund management is a relatively new core competence for the real estate and development (chartered surveyor) professional. It forms an important sector sitting above the physical property asset management layer. Accordingly, a comprehensive grounding in the principles and practice of property investment and finance is essential for this sector. The module introduces and develops the concept and practice of property fund management in relation to real world market activity and includes a consideration of property finance. This gives you an increasing awareness of the role of property as an investment asset class, its use as an investment and the means of financing property investments and developments. In particular, it emphasises both theoretical and analytical aspects of property decision making in the context of property portfolios formation and management.	

6	Indicative Content
Property fund management process Investment decision making Property finance structures Stakeholder motivations Fund strategies Performance measurement	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
	1 Examine the property fund management process, looking at investment decision making in the property market context.
	2 Evaluate the concepts of property investment, and the various property finance structures for a given situation.
	3 Assess the significance of the different motivations of investors, financiers and tenants.
	4 Formulate a reasoned fund strategy, including performance measurement challenges.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		

9	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	82	
Private Study (PS) includes preparation for exams	70	
Total Study Hours:	200	

Module Specification

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Module Summary Information

1	Module Title	Urban Design Practice in Context
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6128

5	Module Overview
This is a design-led module, allowing you to implement and practice advanced design skills in response to a small-scale design project. This module is underpinned by a series of lectures relating to the history and theory of urban and architectural form and design; and time is also devoted to studio-based and lab work that helps develop and enhance your design enquiry and creative drawing / model-making skills. The module also encourages you to explore the wider role of, and connections between, design theory & practice, governance, planning and how innovative design strategies might be used to resolve complex issues associated with contemporary urban challenges.	

6	Indicative Content
The module introduces key concepts of urban design, and urban and architectural form, and the identification and analysis of the qualities of urban places in the production of an initial design concept. These are developed and applied through individual and group exercises, both on site and in class. A series of exercises – including your own critical reflective commentary – develops your design inquiry skills, which will then be expressed through a range of means including words, drawings and models (digital or otherwise). Examples of real urban design projects are identified and critiqued as 'precedent studies' in order to generate ideas that can be applied to a real site in need of improvement.	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
1	Create robust design-based proposals for a development project which seeks to respond to a range of sustainability challenges.
2	Critically reflect on the quality of information required for a development project designed to deliver a range of benefits to different user groups.
3	Formulate independent conclusions based on a rigorous, analytical and critical approach to project requirements.
4	Professionally communicate design information relating to variety of forms of production and output.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-3	X		
4			X

9	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	40	
Private Study (PS) includes preparation for exams	112	
Total Study Hours:	200	

Module Specification

Module Summary Information

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1	Module Title	Hydraulics and Drainage
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6131
5	Semester Taught	1

6	Module Overview
In accordance with the programme philosophy and aims, this module has been designed to enable learners to use problem-based learning to understand the theories and applications of hydraulics in civil engineering, including flow of fluids and theories relating to pumps, many demonstrated through laboratory experiments. Theories are then practically applied drainage system design. The module follows the Civil Engineering programme philosophy of developing your intellectual and practical competence in technical, economic, theoretical and environmental aspects of civil engineering. Similarly, the learning and teaching philosophy incorporates learning through formal lectures including presentations, seminars, tutorials, hands-on experience, learning sets and problem-based scenarios. Learning is practice-based, and knowledge applied including project-based activities. Learning activities will incorporate formative assessment including work-related learning and problem solving, in-class tasks, seminar work and learning sets. The assessment outline section below details assessment for this module by way of an end examination. Practical work within this module includes practical demonstrations, seminar, laboratory and tutorial work, use of ICT as a visual tool and problem-based scenarios. You are encouraged to plan their own work schedules, manage their time and extend their presentational skills.	

7	Indicative Content
In this module you will be covering the following topics: • Fundamental of fluid mechanics • Conservation equations applied in pipes • Real flow in pipes • Turbines and pumps • Steady uniform flow in open channels • Open channel flow in varying conditions • Hydrology of river flow • Hydrology of surface water drainage • Venturi meter and Bernoulli's theorem • Friction loss in pipes • Broad crested weir	

8	Module Learning Outcomes		
	On successful completion of the module, you will be able to:		
	1	Evaluate engineering hydrostatic problems using analytical techniques.	
	2	Assess engineering fluid flow problems and match pumps to the demands of a specific system.	
	3	Experiment by following hydraulic procedures to measure and examine properties and control of flow taking account of health and safety.	
	4	Design efficient and sustainable drainage networks by applying hydraulic principles and accounting for site constraints.	

9	Module Assessment		
Learning Outcome Number (from table 8)	Coursework	Exam	In-Person
1, 2 and 4		70%	
1 and 3	30%		

10	Breakdown Learning and Teaching Activities		
Learning Activities	Hours	Details of Duration, Frequency and other comments	
Scheduled Learning (SL) includes lectures, practical classes and workshops as specified in timetable	48	9 x 2h lecture 9 x 2h seminar 3 x 4h practical (laboratory)	
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE	20	12 x 2h directed Learning which includes critical reading, online learning, Moodle material and peer learning.	
Private Study (PS) includes preparation for exams	132	12 x 8h self-study 1 x 32h additional preparation for the exam	
Total Study Hours:	200		

11	Key Texts and Online Learning Resources
Purchase	
None	
Essential (Books/Journals/Specific chapters/Journal Articles)	

Hamill, Les (2011). Understanding Hydraulics, Third Edition, Palgrave Macmillan, Basingstoke.
Chadwick, Andrew; Morfett, John and Borthwick, Martin, Hydraulics in Civil and Environmental Engineering, 5th Edition. CRC Press, Taylor & Francis Group, 2013.

Wynn, Peter, Hydraulics for Civil Engineers, London: ICE Publishing, 2014.

Johnson, James E, Hydraulics for Engineering Technology, Englewood Cliffs, N.J.: Prentice Hall, 1996.

Chow, Ven Te, Open-channel Hydraulics, Caldwell, New Jersey: The Blackburn Press, 1959.

Melvyn Kay, Practical Hydraulics and Water Resources Engineering (3rd Revised edition), CRC Press, 2016.

Donald W. Knight, Paul Samuels, Caroline McGahey, Rob Lamb, Practical Channel Hydraulics: Roughness, Conveyance and Afflux, CRC press, 1 edition, 2009.

Recommended

Chadwick, Andrew; Morfett, John and Borthwick, Martin (2013). Hydraulics in Civil and Environmental Engineering, 5th Edition. CRC Press Boca Raton, Fla.

Hamill, Les (2011). Understanding Hydraulics, Third Edition, Palgrave Macmillan, Basingstoke.

Martin Marriot (2016) Nalluri and Featherstone's Civil Engineering Hydraulics: Essential Theory with Worked Examples 6th Edition.

Wynn, P. (2014) Hydraulics for Civil Engineers (ICE Textbook Series).

Background

Fundamental Maths

Module Specification

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Module Summary Information

1	Module Title	Digital Design Practice with Existing Buildings
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6133

5	Module Overview
This module will provide you with a foundation of knowledge and practice to establish and execute the BIM process, facilitate its adoption, and achieve site survey data to execute multiple BIM data developments for a client representative. The project development will focus a specified building. The assessment builds on your ability to conduct a professional site survey, develop as-built BIM data for a client, and drawing outputs from site survey and independent desk studies.	

6	Indicative Content
- Define process, adoption, and integration as related to BIM implementation. - Conduct a professional site survey on a building. - Communicate professionally with clients and the general public during a site survey. - Describe the roles and responsibilities of participants in the BIM process. - Develop an independent desk study of historical construction methods and materials. - Develop custom BIM data for client delivery. Communicate the BIM process to management, colleagues, and project stakeholders.	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
	1 Plan for and manage the effective application of current UK development standards on BIM project delivery for existing buildings.
	2 Critically evaluate a client brief and structure a response to initially clarify and subsequently provide suitable solution to client briefing.
	3 Critically appraise and effectively employ key competencies, skills and attributes for effective professional practice during site surveys.
	4 Assess and implement BIM application skills for the development of custom model data for client delivery.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		
9	Breakdown Learning and Teaching Activities		
Learning Activities	Hours		
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	48		
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	72		
Private Study (PS) includes preparation for exams	80		
Total Study Hours:	200		

Module Specification

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Module Summary Information

1	Module Title	Structures 2
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6135
5	Semester Taught	

6	Module Overview
In accordance with the programme philosophy and aims, this module has been designed to enable students to use problem-based learning to understand the Structural Design process and relate it to information previously learned in Structures 1 and Civil Engineering Materials. The module covers both analytical and numerical modelling of structures in order to provide the background for the students to produce the structural design of a small building. The effect of loading combinations is addressed utilising the approach specified in British Standards and European Norms. Aspects of analytical modelling are considered for structural design to the Eurocodes, utilising the UK National Annexes, for the common structural materials. Sustainability aspects of materials, as well as the design choices of the engineer are considered. Numerical aspects are covered via the Finite Element Method (FEM) and related software. Learning activities incorporate formative assessment including problem solving, in-class tasks, and seminar work. The assessment outline section below details assessment for this module by way of coursework. Practical work within this module includes use of ICT as a visual tool, problem-based scenarios and group work. Students are encouraged to plan their own work schedules, manage their time and extend their presentational skills.	

7	Indicative Content
1. Assess design actions on structures according to Eurocodes 0 & 1. • Basis for design according to Eurocode 0 • Loading models and combinations according to Eurocode 1 2. Design structural members to the Eurocodes. • Structural design of timber to Eurocode 5 • Structural design of steel to Eurocode 3 • Structural design of concrete to Eurocode 2 • Structural design of masonry to Eurocode 6 • Effects of optimisation on the sustainability of structures Sustainability aspects of structural materials Sustainability aspects of non-structural materials	

3. Assess structures considering the effects of stiffness, mass, and damping in the design process.

- Matrix methods for structural analysis

4. Appraise structures utilising Finite Element Analysis (FEA)

- Upper- and lower-bound FEA
- Non-linear analysis
- The ANSYS software

8	Module Learning Outcomes
	On successful completion of the module, students will be able to:
1	Assess design actions on structures according to Eurocodes 0 & 1.
2	Design structural members to the Eurocodes, taking into account sustainability and optimisation aspects.
3	Assess structures considering the effects of stiffness, mass, and damping in the design process.
4	Appraise structures utilising Finite Element Analysis (FEA).

9	Module Assessment
Learning Outcome	
	Coursework
	Exam
	In-Person
1-4	X

10	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	Details of Duration, Frequency and other comments
Scheduled Learning (SL) includes lectures, practical classes and workshops as specified in timetable	48	<i>2hr lecture x12, 2hr seminar x12</i>
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE	56	<i>Work-based learning, peer and group learning.</i>
Private Study (PS) includes preparation for exams	96	<i>Coursework preparations.</i>
Total Study Hours:	200	

11	Key Texts and Online Learning Resources
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State key texts and other online resources.

Purchase

- ICE's Designer's Guide to the Eurocodes series

Essential (Books/Journals/Specific chapters/Journal Articles)

- Trahair, Bradford, Nethercot and Gardner (2007). The Behaviour and Design of Steel Structures to EC3, 4th edition. London Taylor & Francis.
- Mosley, Bungey and Hulse (2012). Reinforced Concrete Design, 7th Edition, Basingstoke Palgrave Macmillan.
- Kermani & Porteous (2014), Structural Timber Design to Eurocode 5, 2nd Edition, Blackwell
- British Standards and European Norms (available via the BSI)
- Olek C Zienkiewicz, Robert L Taylor "The Finite Element Method for Solid and Structural Mechanics", Seventh Edition, Butterworth-Heinemann, 2014.
- Logan, Daryl L., "A first course in the finite element method", Sixth Edition, Australia: Cengage Learning, 2016.
- Desai, C.S "Introductory finite element method", Boca Raton, FL: CRC Press, 2001.
- Hutton, David V, "Fundamentals of finite element analysis", Boston: McGraw-Hill, 2004.
- Kim, Nam-Ho, "Introduction to finite element analysis and design", Hoboken, N.J.: Wiley; Chichester: John Wiley, 2008.

Recommended

- ICE's Designer's Guide to the Eurocodes series

Background

- The Structural Engineer (magazine)
- IStructE Structures (journal)

Module Specification

Module Summary Information

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1	Module Title	Bid Strategy and Professional Practice
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6205
5	Semester Taught	1

6	Module Overview
- This module will focus on extending and providing appropriate evidence of your professional skills and development. Within an applied socially responsive framework, you will examine a range of issues related to the client, the site, planning, financial/development appraisal, design technology, legal and regulatory, health and safety etc. These will be covered in conjunction with other professional courses or your own discipline as appropriate, given that all built environment professions and recent reports such as the Farrell Review place increasing stress on interdisciplinary understanding and working.¹ - This module provides you with a critical appreciation and understanding of the principles, tools, methods and processes of consultancy and professionalism and their linking in a wider citizenship agenda, together with experiential/practice-based learning through a 'hands-on' group-based consultancy assignment with a real client organisation (public/private, services/manufacturing). You will be required to deconstruct and negotiate a consultancy project in situations where initially there may be a lack of clarity, high ambiguity, intense uncertainty and unusual data, apply a range of frameworks to structure analytical thinking, apply techniques to complete the required research, and demonstrate effective communication skills in delivering the results to the client. Through the project, you will develop skills for effective engagement and intervention, further understand your strengths and weaknesses in relation to teamwork and leadership skills, and further enhance your managerial capabilities. - These will be reflected in a group presentation on the consultancy project and an individual written assessment element relating to the professional practice development for your discipline. - The aim of the module is to introduce you to key contemporary social thinking within the Built Environment, centred on community, built environment diversity and inclusivity issues. This will provide you with the tools to develop critical awareness and the initiative to bring about innovative change to positively impact on our society.	

7	Indicative Content
This module will provide a national and international context for the professional and the interplay of professions across the industry. The module will typically cover:	

- Ethics, Codes of Conduct and the Chartered Professional. Citizenship and corporate social responsibility.
- The social and industry consequences of failures in health and safety stewardship from a personal and corporate perspective through a series of case studies.
- Client care and professional relationships. Enhancing the image, efficiency and professionalism of the built environment.
- Topical issues: Whistleblowing, modern slavery, bribery & money laundering, inclusive environments workplaces and practices, etc.
- It is not intended to confine or limit the module to just these areas and allowance should be made to include these and current and topical issues impacting the built environment.
- The module will require students to review and reflect on these areas, the impact of these on themselves, the industry they are entering and broader society.

8		Module Learning Outcomes On successful completion of the module, students will be able to:
	1	Critically evaluate and apply relevant academic theory to a practical environment and communicate ideas to a specialist audience.
	2	Appraise key issues and problems in complex construction situations and develop successful strategies for dealing with issues in uncertain and ambiguous contexts.
	3	Prepare and present a construction tender for a proposed project in a commercial context.
	4	Develop a Personal Development Plan for your appropriate PSRB.

9				Module Assessment
Learning Outcome Number (from table 8)	Coursework	Exam	In-Person	
1-3				X (75%)
4	X (25%)			

10			Breakdown Learning and Teaching Activities
Learning Activities	Hours	Details of Duration, Frequency and other comments	
Scheduled Learning (SL) includes lectures, practical classes and workshops as specified in timetable	48	Lectures and seminars for 12 weeks	
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer	72	On-line activity Graduate+ peer learning external visits	

learning, as directed on
VLE

Private Study (PS)
includes preparation for exams

80

Secondary Research

Total Study Hours:

200

11

Essential (Books/Journals/Specific chapters/Journal Articles)

Adair, J. (2009) *Leadership and Motivation*, Kogan Page, London

Brook, M (2016) Estimating and Tendering for Construction Work 5th Edition, Butterworth

Boddy, D. and Patton, R. (1998) *Management: An Introduction* Prentice

Grint, K. (2005), *Leadership: limits and possibilities*, Macmillan, Basingstoke

Hayes, Philip. 2011., *Leading And Coaching Teams To Success: The Secret Life of Teams*. Open University Press, McGraw Hill Education.

Lewis, James P. 2007., Fundamentals of Project Management 3rd Edition. AMACOM books.

Lock, Dennis. 2013., Project Management. 10th Edition Ashgate Publishing.

March, C (2009) Business Organisation for Construction, E & FN Spon, London

March, C (2009) Finance and Control for Construction, E & FN Spon, London

March, C (2009) Operations Management for Construction, Taylor Francis

McCaffer, H (2013) Modern Construction Management 7th Edition, Blackwell

Mullins, L. (2010) Management and Organisational Behaviour 9th Edition. Prentice Hall, Harlow

Newton, R. (2009) "Project Manager: Mastering the Art of Delivery in Project Management". 2nd Edition, Prentice Hall, London

Recommended

<http://www.rics.org>

The Royal Institution of Chartered Surveyors

www.building.co.uk

Building Magazine

www.ciob.org.uk

The Chartered Institute of Building

Background

Farrell, T. (2014) [The Farrell review of Architecture and the Built Environment](#), Department for Culture, Media and Sport, London.