

College of Built Environment

Academic Year 2023/24 - Semester 2

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
BNV4101	Design and Surveying Skills	4	20	10
BNV4102	Residential Quantification and Cost	4	20	10
BNV4104	Integrated Digital Design - Residential	4	20	10
BNV4105	Introduction to Property Markets	4	20	10
BNV4107	Introduction to Valuation	4	20	10
BNV4110	Professional Environmental and Materials Science	4	20	10
BNV4114	Legal Obligations in the Built Environment	4	20	10
BNV4121	Innovation in the Built Environment	4	20	10
BNV4127	Civil Engineering Principles 2	4	20	10
BNV4128	Construction Site Management Practice	4	20	10
BNV4135	Architectural Design Studio 2	4	20	10
BNV5107	Commercial Quantification and Cost	5	20	10
BNV5108	Commercial Management	5	20	10
BNV5109	Advanced Valuation Methods	5	20	10
BNV5111	Data and Decision Making	5	20	10
BNV5113	Integrated Digital Design - Commercial	5	20	10
BNV5115	Property Asset Management	5	20	10
BNV5117	Smart Policies and Plans	5	20	10
BNV5120	Integrated Digital Design for Complex Structures	5	20	10
BNV5121	Civil Engineering Applications	5	20	10
BNV5125	Design Practice	5	20	10
BNV5126	Advanced Design and Surveying Skills	5	20	10
BNV5132	Civil Engineering Materials	5	20	10
BNV5135	Operational Management	5	20	10
BNV5136	Money Matters in Construction	5	20	10
BNV5146	Emerging Digital Technologies	5	20	10
BNV5147	Digital Cities	5	20	10
BNV5151	Technological Design Studio 2	5	20	10
BNV6119	Contract Practice	6	20	10
BNV6121	Civils Quantification and Cost	6	20	10
BNV6125	Professionalism and Citizenship	6	20	10
BNV6127	Property Marketing	6	20	10
BNV6130	Commercial Building Pathology and Surveying	6	20	10
BNV6132	Geotechnical Engineering	6	20	10
BNV6134	Advanced Analysis and Design Methods	6	20	10
BNV6136	Research in Practice	6	20	10
BNV6204	Sustainable Building Design and Construction	6	20	10

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1	Module Title	Design and Surveying Skills
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4101

5	Module Overview
<p>This module will support the Architectural Technology and Building Surveying courses and aims to:</p> <ul style="list-style-type: none"> • Provide you with a broad based study of Architectural Technology together with the personal qualities of observation, analysis, judgement and communication appropriate for the profession. • Provide you with a clear understanding of how their decisions regarding technology, materials and design impact on the environment. • Provide you with the ability to communicate effectively using appropriate technical language and drawings associated with the practice of Building Surveying. • Provide you with an understanding of the whole life structure and fabric of the built environment. 	

6	Indicative Content
<p>Topics covered will include:</p> <ul style="list-style-type: none"> • Freehand and orthogonal drawing methods. • Construction drawing production using computer software. • Research for design decision making. • Recording learning in a structured format. • Creation of building specifications. • Appreciation of structural form, building stability and economy in design. • Traditional building survey methods and recording techniques. • Physical building model construction using simple model making techniques. • Visual presentation material/methods. 	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
1	Employ a range of creation and modifier tools within the CAD and BIM software to produce high-quality building models and drawings within industry standard parameters.
2	Employ freehand sketching and technical drawing skills to produce annotated construction detail drawings together with a structured record of research and decision making.

	3	Use photographs and observational measurement to research, record and produce building surveys.
	4	Apply industry standard specification, financial and structural techniques.
	5	Employ appropriate techniques to record self-development in a professional format.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-5	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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1	Module Title	Residential Quantification and Cost
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4102
5	Semester Taught	2

6	Module Overview
	<ul style="list-style-type: none"> In this module you will be introduced you to the core Quantity Surveying skill of quantification and cost. This introductory module provides you with an understanding of the procedures for costing, via the development of the skills of measurement and interpretation of construction drawings. You will apply the measurement principles, Industry standard descriptions and develop specificationsto enable you to prepare and manage cost estimates. This module will feed forward into your level 5 and 6 measurement and cost modules.

7	Indicative Content
	<ul style="list-style-type: none"> The skills of quantification and cost to your Built Environment Technology 1 assessment Measurement of finishes (floor, walls and ceilings), floors (ground and first), external works, roofs, substructure, schedules and internal walls Quantification, description, specification, pricing documentation and appreciation of the cost consultant's role Communication and problem solving skills in providing professional advice to the client

8	Module Learning Outcomes
	On successful completion of the module, students will be able to:
	1 Interpret drawing and specification information to measure and generate quantities using a Standard Method of Measurement for finishes.
	2 Generate quantities for finishes, external works, floors, roof, walls, foundations, doors and windows and convert take off into pricing documents.
	3 Identify and explain the functions of a cost consultant during the stages of RIBA plan of work with particular focus on fair trade and economy.
	4 Apply early estimation techniques to produce an estimate for a simple building.

9	Module Assessment		
Learning Outcome Number (from table 8)	Coursework	Exam	In-Person
1-4	X (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	Lectures and seminars 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	You will be set a series of measurement tasks, you will be expected to complete this within the class and in your own time as directed by the Module team
Private Study (PS) includes preparation for exams	90	You will be expected to continually work on your portfolio aligned to the class tasks and coursework set. And engage in using Moodle and other resources provided in the module documentation and expand into other self-selected resources as appropriate.
Total Study Hours:	200	

11 Key Texts and Online Learning Resources	
Essential (Books/Journals/Specific chapters/Journal Articles)	
Ashworth, A. and Perera, S. (2015) <i>Cost studies of buildings</i> . 6 th edn. London: Routledge, Taylor & Francis Group.	
Cartlidge, D. P. (2017) <i>Quantity surveyor's pocket book</i> . 3 rd edn. London: Routledge.	
Cartlidge, D. (2019) <i>Estimator's Pocket Book</i> . 2 nd edn. Milton: CRC Press LLC.	
Cartlidge, D. P. (2017) <i>New aspects of quantity surveying practice</i> . 4 th edn. London: Routledge.	
Murray, M. and Langford, D., (2004) <i>Architects Handbook of Construction Project Management</i> , London: RIBA Publishing. This book is out of print now. We only have 1 copy.	
Morton, R. and Jagger, D. (1995) <i>Design and the Economics of Building</i> . London: E & FN Spon.	

Ostrowski, S (2013) *Measurement Using the New Rules of Measurement*, John Wiley & Sons Ltd: West Sussex.

RIBA Enterprises (2008) *RIBA plan of work: multi-disciplinary services*. London: RIBA Publishing.

RICS (2012) *New Rules of Measurement 2 (NRM2) Detailed Measurement for building works*. 1st Edn..London:RICS.

Recommended

Harvey, R. C. (1993) *The construction industry of Great Britain*. Oxford : Butterworth-Heinemann

Morton, R. and Ross, A. (2008) *Construction UK : introduction to the industry*. 2nd edn. Oxford: Blackwell.

Nisbet, J. (1997) *Quantity surveying in London 1650 to 1940*. London: Stoke publications.

Packer, A. (2017) *Building measurement : new rules of measurement*. 2nd edn. London: Routledge.

Rowe, R. N. (2002) *Refresher in basic mathematics*. 3rd edn. London: Continuum.

Stroud, K. A. and Booth, D. J. (2009) *Foundation mathematics*. Basingstoke: Palgrave Macmillan.

Virdi, S. S. et al. (2014) *Construction mathematics*. 2nd edn. Abingdon: Routledge.

Wheeler R J, Clarke A V (1992) *Building Quantities Worked Examples*. 3rd edn. Oxford: Butterworth-Heinemann

Background

Any published Price Books e.g. Spons, Wessex, Griffiths

Articles from Technical Journals and Periodicals as directed

<http://www.rics.org/uk/> The Royal Institution of Chartered Surveyors

<http://www.building.co.uk/> Building Magazine

https://librarysearch.bcu.ac.uk/permalink/44BCU_INST/15fig5r/alma991003059668406701

<http://www.ciob.org/> The Chartered Institute of Building

Construction Information Service:

<https://go.openathens.net/redirector/bcu.ac.uk?url=https%3A%2F%2Fwww.ihssso.com%2Fukplc>

Isurve: <http://isurv.com/> BCIS: <https://ezproxy.bcu.ac.uk/login?url=https://www.isurv.com/>

<http://www.bcis.co.uk/>

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1	Module Title	Integrated Digital Design - Residential
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4104

5	Module Overview
<p>Digital construction is an integral component of contemporary design, development and maintenance of modern residential development. Building Information Modelling (BIM) technology is at the forefront of the progressive movement towards total digitalisation of the built environment.</p> <p>Against this backdrop, this module aims to provide a foundation for you to successfully execute the BIM process, facilitate its adoption and achieve interdisciplinary integration on a single project that simulates a residential project.</p> <p>Specifically, individual programme cohorts (i.e. those studying either <i>real estate</i>, <i>construction management</i>, <i>architectural technology</i>, <i>planning</i> or <i>building surveying</i> programmes) will execute multiple BIM data developments throughout the building's lifecycle simultaneously – these individual developments will then be amalgamated to produce a federated BIM model that contains all course work submitted for each group as a final bid report. Specifically, each of the disciplines will produce broadly the following.</p>	

6	Indicative Content
<p>An essential part of this portfolio coursework is the ability to collaboratively work within an integrated project management team that consists of members of the various professional disciplines (i.e. Quantity Surveyors, Building Surveyors, Real Estate Surveyors, Construction Managers, Planners and Architectural Technologists).</p> <p>The culmination of work conducted during the module will produce a group report and bid proposal for a client on a new residential scheme. The client will be a local architectural practice who will provide the BIM models, the design brief and site visit to assist students with producing the coursework.</p> <p>There are three interrelated aspects of the project coursework, namely: i) defining the coursework itself (and practitioner support available for such); ii) the site visit which will expand the student's knowledge of digital construction in practice; and iii) coursework assessment and feedback.</p>	

7	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Identify and apply current UK development standards on a residential BIM project.
	2	Establish an understanding of integrated digital project delivery for all discipline specific programmes.
	3	Employ key competencies for effective professional practice with clients.

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
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE		92
Private Study (PS) includes preparation for exams		60
Total Study Hours:		200

Module Specification

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1	Module Title	Introduction to Property Markets
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4105

5	Module Overview
<p>This module is unique to the BSc Real Estate programme.</p> <p>As a key component of the built environment, real estate forms a significant part of the market economy. Knowledge of the property markets across different sectors and the drivers of space, property and capital markets will be introduced. Market structures, concepts and determinants will provide an increased awareness of property fundamentals that make property an attractive and challenging asset class.</p> <p>The aim of this module is to introduce you to the property markets. It will focus on the different types of property markets and the role of the property in the wider economy from a social, economic and investment perspective. In this introduction module you will learn about the activities of the various property stakeholders, the different property types and the range of property investment instruments, for example property trusts. This module will enable you to develop critical investigation skills in solving challenges in the property market in a professional context.</p>	

6	Indicative Content
<p>Module covers:</p> <p>The three property market principles: space, property and capital markets. Details the fundamentals of property markets. Identify competing asset classes, detail why property offers unique opportunities. Understand the different property types and property stakeholders. Detail the importance of diversification across the property sector. Identify the characteristics of property as an investment class. Examine the value added options for property. Detail the property investment universe, local and international property. Detail strategy to invest offshore and highlight benefits and issues with global property investment. Identify investor types and their portfolio strategies. Explain the concept of the investment pyramid. Discuss the decision making process for investing in commercial property. Detail the various property investment vehicles. Real Estate Investment Trusts: Understand the REIT structure and examine REIT performance measures and discuss the role of property securities funds</p>	

7	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Source detailed information on a defined property sector.
	2	Review property investment options, assessing characteristics and performance.
	3	Identify and describe the key components of a property investment vehicle.
	4	Prepare and deliver a quality property investment report to an industry standard.

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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1	Module Title	Introduction to Valuation
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4107

5	Module Overview
<p>Valuation is a crucial skill across the built environment and is core to many professional pathways.</p> <p>This module introduces the theory of valuation as a set of principles, financial mathematics, methods and techniques employed for identifying and understanding economic concepts of value and worth in a property context.</p> <p>You will build an understanding of the central role of valuation for the efficient functioning of the property markets and the wider economy (regionally, nationally and internationally) and develop background knowledge of the tools and techniques required to provide prudent advice when dealing with property.</p> <p>This module will give you the foundational valuation tools that will then be built upon in subsequent modules as you develop your practical skills in valuing a wide range of assets for different purposes including sales, development appraisal, asset and investment management.</p>	

6	Indicative Content
<p>Over the course of this module you will be introduced to the following:</p> <p>Economic perspectives of property, price mechanisms and property markets.</p> <p>Valuation concepts principles and financial mathematics</p> <p>The five methods of valuation</p> <p>Property measurement and zoning</p>	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
	1 Discuss the roles of property in the wider economy and be able to analyse the fundamental economic issues driving the property market.
	2 Describe the basic aspects of property investment and the key principles and factors that influence concepts of value.
	3 Identify the different purposes for which valuations are undertaken and apply financial mathematics to the valuation of property.

	4	Discuss the use of valuation methods, techniques and principles to provide both capital and rental valuation advice.
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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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1	Module Title	Professional Environmental and Materials Science
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4110

5	Module Overview
<p>Environmental and materials science is an important area of study for all disciplines involved with the design, planning, developing and management of the built environment. This module encourages you to consider how the properties, structures and performance of materials influence why buildings and structures function. You will be encouraged to consider how these properties impact construction from a design and practical use perspective. This module will therefore enable you to develop innovative solutions for more robust, resilient, safe and sustainable buildings and structures. It also gives you the opportunity to produce a professional cv and related documents which you will share with industry on your assessment day.</p> <p>The module focuses on the scientific principles of a low-rise development and the innovations within the built environment. Using directed learning exercises you will produce a professional portfolio throughout the module exploring issues including design technology, building methods, energy use and thermal effect. Many of these issues relate closely to the changing landscape of the sustainability agenda, which affects all built environment disciplines from planning and design to property management. In groups you will produce a final professional portfolio which will be presented to a panel on an assessment day. Representatives from both academia and industry will be viewing the completed work on the assessment day. Therefore, this module is an excellent opportunity to develop your written, verbal, employability, self-awareness and other career-related skills, as well as building knowledge of environmental sustainability and the implications of using building materials.</p>	

6	Indicative Content
<p>Recording accurate and relevant field notes to a professional standard by the production of a portfolio. Effective group working sharing knowledge and practice between disciplines.</p> <p>Topics covered will be sound, lighting, thermal comfort, sustainability, innovation, traditional building materials. These topics will be explored in a variety of ways and will be discussed with the context of each specific discipline (planning, building surveying etc). Placing the Health and Safety at Work Act 1974 within the context of each of the subjects will also be a requirement of the portfolio. Specifically legislation such as CDM 2015, RIDDOR 2013, Control of Asbestos Regulations 2012 and the Control of Noise 2006 will be embedded within the topics and delivery of teaching. Students will be expected to consider these along with other suitable health and safety legislation and relate them directly to their own discipline within their final portfolio submission.</p> <p>Qualitative and quantitative research methods will be used and expected to be utilised within the final portfolio with an emphasis on innovation within these areas.</p>	

7	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Employ the key principles of effective group working skills and communication relating to built environment professions and clients, producing a profession business related document.
	2	Document and communicate progress of portfolio work identifying and explaining common terminology relating to environmental and materials science.
	3	Explain key principles of materials science and their application to building performance within a series of prepared sections of a portfolio.
	4	Describe current agendas in relation to sustainability and renewable energy relative to buildings and building materials and demonstrate these findings within the final portfolio.

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

1	Module Title	Legal Obligations in the Built Environment
2	Module Credits	20
3	Module Level	Level 4
4	Module Code	BNV4114

5	Module Overview
<p>This module is delivered to all HNC students in the built environment disciplines and provides you with the basic legal concepts and principles you will need throughout your professional career. The module introduces you to the different areas of law that are relevant to the construction industry throughout the development process. It covers the legal structure and processes of the English legal system and provides the essential foundation to the legal skills necessary for the provision of sound advice to your clients/colleagues later in your professional career.</p> <p>In particular, this module will focus on legal and regulatory frameworks which shape the design, development and management of buildings and places. You will explore the English legal system and how law is made, applying for planning approval to undertake construction activities and using building control regulations to evaluate building design and alterations. This will also include contract and tort law including nuisance, negligence and occupiers' liability, and the legal aspects of the sale and leasing process involved in the disposal of buildings.</p> <p>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.</p>	

6	Indicative Content
<p>The content of the module include the following key areas:</p> <p><u>The law of tort</u> This will cover the key requirements of tort law as applied to the built environment and include topics such as negligence, occupier's liability, nuisance and trespassing.</p> <p><u>contract law</u> This subject will cover the key requirements for setting up contracts in the building environment and how this is translated into construction contracts.</p> <p><u>Construction contracts</u> This section considers the common standard contract types used in the construction industry such as JCT and NEC contracts.</p> <p><u>Dispute resolution</u> The processes for dispute resolution including the main ADRs used in the construction industry will be covered under this topic.</p>	

Health and safety regulations

This topic covers the key requirements for safe operation of construction sites and adjoining structures including the requirements of CDM regulations.

Planning & Environmental law

This section covers the key requirements and processes for securing planning permissions for construction and alteration of buildings.

Building control regulations

This section covers the processes used to control the design of buildings.

Land law

This section covers the processes and requirements used to sell and lease land and buildings.

7	Module Learning Outcomes	
	On successful completion of the module, students 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 how the law of contract and land law are used to sell and lease land and buildings.	
3	Explain the causes and implications of various torts as they apply to your professional area.	
4	Discuss the requirements of health and safety in the design and construction of buildings.	
5	Demonstrate professional verbal communication skills.	

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		
5			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	Innovation in the Built Environment
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4121
5	Semester Taught	2

6	Module Overview
<p>The fast pace of development in the built environment has led to improvements in the design and management of projects in the built environment with the use of modern technologies, processes and techniques for delivering value for money on project. The successful introduction of new technologies or procedures into the built environment context is critical for the improvement of the industry. For the built environment professionals of the future, this means the need to master modern and innovative technologies and techniques for designing and building faster, using more sustainable materials and methods, and within reasonable cost.</p> <p>This module explores different conceptions of innovation and seeks to devise strategies for successful implementation of innovation by presenting you with the opportunity to investigate and apply innovative solutions to issues in the built environment. The module provides you with leading-edge knowledge on innovative management practices and technologies adopted in the design and management of construction projects and exposes you to change management principles required to design and implement innovative ideas in real life context.</p> <p>As part of the assessment, you will critically assess appropriate innovative technologies and practices within the framework of a sustainable built environment.</p>	

7	Indicative Content
<p>Modern construction methods Building Information Modelling Offsite production and prefabrication Big Data Integrated Project Delivery Green Concrete ICT in construction Megaproject management Modular Construction Improvement in organisation of construction activities Internet of Things Virtual Reality and Augmented Reality Systems thinking for innovation Innovation theory Change management within the construction industry 3D Printing Sustainability Renewable energy</p>	

8	Module Learning Outcomes	
	On successful completion of the module, you will be able to:	
	1	Examine the significance of innovative approaches, technologies and materials in the success of built environment projects.
	2	Review innovative approaches, technologies and materials and their application in delivering projects in the built environment.
	3	Identify potential innovations for a real-life built environment context.
	4	Promote, plan for and implement a particular innovation in a real-life built environment context.

9	Module Assessment		
Learning Outcome Number <i>(from table 8)</i>	Coursework	Exam	In-Person
1, 2	Coursework 50%		
3, 4			Presentation 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 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	72	On-line activity Graduate+ peer learning external visits
Private Study (PS) includes preparation for exams	80	Secondary Research
Total Study Hours:	200	

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

Anumba, C.J., Egbu, C. and Carrillo, P. eds., 2008. Knowledge management in construction. John Wiley & Sons.

McGeorge, D. and Zou, P.X., 2012. Construction management: new directions. John Wiley & Sons.

Sawhney, A., Riley, M. and Irizarry, J., 2020. Construction 4.0: An Innovation Platform for the Built Environment.

Harris, F. and McCaffer, R., 2013. Modern construction management. John Wiley & Sons.

Hardin, B. and McCool, D., 2015. BIM and construction management: proven tools, methods, and workflows. John Wiley & Sons.

Halpin, D.W., Lucko, G. and Senior, B.A., 2017. Construction management. John Wiley & Sons.

Walker, D., 2015. Risk managing complex projects through alliancing. The Journal of Modern Project Management, 2(3).

Gray, C. and Hughes, W., 2007. Building design management. Routledge.

Forbes, L.H. and Ahmed, S.M., 2010. Modern construction: lean project delivery and integrated practices. CRC press.

Priemus, H., Flyvbjerg, B. and van Wee, B. eds., 2008. Decision-making on mega-projects: cost-benefit analysis, planning and innovation. Edward Elgar Publishing.

Dainty, A., Moore, D. and Murray, M., 2007. Communication in construction: Theory and practice.

Routledge. Manseau, A., 2019. Building tomorrow: innovation in construction and engineering.

Routledge. Background Håkansson, H. and Waluszewski, A. eds., 2007. Knowledge and innovation in business and industry: The importance of using others. Routledge. Havensvid, M.I., Linné, Å.K., Bygballer, L.E. and Harty, C. eds., 2019. The Connectivity of Innovation in the Construction Industry. Routledge.

Coffey, V., 2010. Understanding organisational culture in the construction industry. Routledge.

Websites

www.rics.org/uk/ Royal Institution of Chartered Surveyors

www.ciob.org.uk The Chartered Institute of Building

www.hse.gov.uk Health & Safety Executive

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Module Summary Information

1	Module Title	Civil Engineering Principles 2
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4127
5	Semester Taught	2

6	Module Overview
<p>Civil engineering infrastructures must be designed in order to resist environmental loadings and impacts. This requires fundamental knowledge of structural analysis of civil engineering structures and behaviour assessment of civil engineering materials subject to various types of loadings and stresses.</p> <p>This module provides the fundamental science of engineering mechanics including statics and mechanics of materials for civil engineers. It lays the foundation for advanced analysis and design of Civil Engineering Structures modules taught in the following years. You will learn how to adopt equilibrium equations to analyse determinate structures and will become familiar with various types of stresses and how those can affect behaviour of civil engineering materials.</p> <p>The module content is delivered under two themes: the first half focuses on Engineering Statics and the second half to Mechanics of Materials. The module uses a combination of lectures and seminars, providing the theoretical knowledge reinforced via worked examples and in-class exercises.</p> <p>During this module, you will gain fundamental employability skills in the Civil Engineering domain and beyond, learning the science of structural analysis and engineering materials, which develops your engineering judgment and ability to identify best engineering solutions.</p>	

7	Indicative Content
<p>In this module you will be covering the following topics:</p> <ul style="list-style-type: none"> • Force and moment vectors • Decomposition, and resultant of a system of forces • Various types of loadings subjected to civil engineering structures • Calculation of reaction forces for determinate beams/pin-jointed structures • Calculation of internal forces for determinate beams /pin-jointed structures • Introduction to material testing • Stress-strain behaviour of materials • Mechanical properties of materials • Steel and concrete behaviour • Centroid and second moment of area for beam sections • Bending stress • Shear stress • Torsional stress • Ductile/brittle behaviour of materials • High/low strength of materials 	

8	Module Learning Outcomes		
	On successful completion of the module, students will be able to:		
	1	Analyse determinate structures using equilibrium equations.	
	2	Demonstrate the stress-strain behaviour of civil engineering materials.	
	3	Calculate normal and planar stresses in beams.	
	4	Explain the implications of material behaviour for engineering design.	

9	Module Assessment		
Learning Outcome Number	Coursework	Exam	In-Person
1-3	Three assessments of 10% each (30%)		
1-4		End of semester exam 70%	

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 12 seminars	
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 exam preparations.	
Total Study Hours:	200 hours		

11	Key Texts and Online Learning Resources
Essential (Books/Journals/Specific chapters/Journal Articles): Beer F.P., Johnston E.R., Mazurek D., (2012). Vector Mechanics for Engineers: Statics, 10 th Edition, McGraw-Hill Education.	

Hibbeler R.C., (2013). Mechanics of Materials, 10th Edition, Pearson.

Recommended:

Hearn E.J., (1997). Mechanics of Materials, 3rd Edition, Butterworth-Heinemann.

Module Specification

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Module Summary Information

1	Module Title	Construction Site Management Practice
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4128
5	Semester Taught	2

6	Module Overview
<p>This module introduces you as a construction management student to site management practice which forms a key part of the construction manager's role and provides the required understanding of the day-to-day management of construction projects. The principal focus of the module focuses on site related tasks such as planning for construction sites, site layout planning, resource management and health and safety on construction sites. The secondary focus is on the construction manager's role in the overall building lifecycle process from inception to completion.</p> <p>The module is designed to help you understand construction management practice, with emphasis on the construction process from inception to completion, including problems on construction sites and the practical approaches to managing people, materials and plant for construction project success.</p> <p>The module will be delivered through lectures and seminars with input from practicing construction site and project managers, to help you have the relevant industry experience required for your employability. As part of the assessments, you will work with site managers to solve site related issues or problems on construction real-life construction projects.</p>	

7	Indicative Content
<ul style="list-style-type: none"> • Progress reporting • Quality management • Resource identification and planning • Site diaries • Workforce behaviour and performance management • Construction waste management practice • Cost management on construction sites • Effective communication on construction sites • Health and safety planning and practice on site and implications for the building life cycle • Information requirement for construction site operations • Leadership on construction sites • Materials delivery and management • Modern technologies for site management • Performance management on construction sites • Progress monitoring on site • Site layout planning, access and storage • Site logistics planning • Time management on construction sites • Understanding construction management practice • Use of ICT in construction site management • Licensing and insurance requirements for construction sites 	

8	Module Learning Outcomes	
	On successful completion of the module, you will be able to:	
	1	Extract construction resource requirements from construction information.
	2	Demonstrate practical understanding of construction time, cost and quality control.
	3	Demonstrate practical understanding of construction site diaries and their implication for progress reporting.
	4	Produce a site layout plan for a construction project.

9	Module Assessment		
Learning Outcome Number <i>(from table 8)</i>	Coursework	Exam	In-Person
1&4			50%
2&3	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 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	72	Direct learning to include researching current site management practice, review of case study projects and group work to prepare for assessments and site visits	
Private Study (PS) includes preparation for exams	80	Private research and study to improve understanding of concepts covered in seminars and lectures, and research towards coursework A.	
Total Study Hours:	200		

11	Key Texts and Online Learning Resources
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- Baldwin, A. and Bordoli, D., (2014). Handbook for construction planning and scheduling. John Wiley & Sons.
- Fewings, P. and Henjewe, C., (2019). Construction project management: an integrated approach. Routledge.
- Harris, F., McCaffer, R., Baldwin, A. and Edum-Fotwe, F., (2021). Modern construction management. John Wiley & Sons.
- Howarth, T. and Watson, P., (2012). Construction quality management: Principles and practice. Routledge.
- Mäki, T. and Kerosuo, H., (2015). Site managers' daily work and the uses of building information modelling in construction site management. Construction management and economics, 33(3), pp.163-175.
- March, C., (2017). Construction management: theory and practice. Routledge.
- Ranns, R.H.B. and Ranns, E.J., (2016). Practical construction management. Routledge.
- Rapp, R.R. and Benhart, B.L. eds., (2015). Construction site planning and logistical operations: Site-focused management for builders. Purdue University Press.
- Rhoden, M., (2016). Construction management and organisational behaviour. John Wiley & Sons.
- Sherratt, F., (2015). Introduction to construction management. Routledge.
- Walker, A., (2015). Project management in construction, 6th edition.; Chichester: Wiley Blackwell.

Module Specification

Module Summary Information

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1	Module Title	Architectural Design Studio 2
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV4135
5	Semester Taught	2

6	Module Overview
<p>This module advances your skills in architectural design and technical knowledge.</p> <p>You will work towards developing a spatially coordinated architectural design based on a client brief and conceptual drawings. You will create suitable solutions for the brief and explain the technical aspect of your design such as construction materials, building structure with the use of architectural drawings and artefacts. You will employ a range of digital tools and technologies to create industry standards technical drawings and representations of your proposal following RIBA Plan of Work Stage 3 as well as learn how to professionally demonstrate and communicate your knowledge to varied audiences.</p> <p>Architectural Design Studio 2 is delivered through a series of workshops, tutorials, and studio-based teaching. In this module, the integration of construction and technology parameters with the architectural design proposals will be practiced and studied comprehensively. This module will help you continue to develop your practice in 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.</p>	

7	Indicative Content
<p>The topics covered in this module include:</p> <ul style="list-style-type: none"> • Building structure, technology and materials. • Architectural presentation techniques • Construction and architectural drawing production using a range of techniques. • Design standards and construction regulations • Sustainable and environmental design principles • Health and safety • Research and critical thinking • Career development and professional skills 	

8	Module Learning Outcomes
On successful completion of the module, you will be able to:	
1	Employ a range of digital tools and technologies to produce 3D models and drawings that align with RIBA Plan of Work Stage 3.
2	Applying structured research, create a record of justified decisions for final selection of building materials and structural form and layout.

	3	Demonstrate and professionally communicate applied knowledge of construction materials, building structure, building technology, sustainability, and innovation in various formats to varied audiences.
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9 Module Assessment			
Learning Outcome Number (from table 8)	Coursework	Exam	In-Person
1, 2, 3	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
<p>Books:</p> <ul style="list-style-type: none"> 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 <p>Online Resources:</p> <ul style="list-style-type: none"> 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

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.

Module Specification

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Module Summary Information

1	Module Title	Commercial Quantification and Cost
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5107
5	Semester Taught	2

6	Module Overview
<ul style="list-style-type: none"> This module will further develop your core Quantity Surveying skills of quantification and cost. During the module you will measure steel structural frames and in situ concrete construction. You will apply the measurement principles, Industry standard descriptions and develop specifications to enable you to prepare and manage cost estimates for more complex work and drawings. This module directly relates to earlier work in your previous studies and will feed forward into your level 6 modules. 	

7	Indicative Content
<ul style="list-style-type: none"> Application of industry software to produce a measure for pricing Quantification, description, specification, and pricing documentation for a number of steel structural frame drawings and in situ concrete construction Communication and problem solving skills to provide professional advice for project directors 	

8	Module Learning Outcomes On successful completion of the module, students will be able to:
1	Apply software to measure, bill and price different work, works sections by the appropriate standard method and appropriate specification.
2	Produce a working process that is methodical, logical, accurate and sequential using appropriate annotations and workings to enable others to understand the work that has been done.
3	Analyse, assess and implement a strategy to manage the impact of inaccurate design, specification and missing information on the project cost.

9	Module Assessment		
Learning Outcome Number (from table 8)	Coursework	Exam	In-Person
1-3	X (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	Lectures and seminars 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	You will be set a complex measurement task and you will be expected to complete this within the class and in your own time as directed by the Module team.
Private Study (PS) includes preparation for exams	90	You will be expected to continually work on your portfolio aligned to the class tasks and coursework set. And engage in using Moodle and other resources provided in the module documentation and expand into other self-selected resources as appropriate.
Total Study Hours:	200	

11 Key Texts and Online Learning Resources	
Essential (Books/Journals/Specific chapters/Journal Articles) Lee, S. (2020) <i>Willis's Elements of Quantity Surveying</i>. 13th edn. Hoboken, NJ : Wiley-Blackwell.Recommended Wheeler R J, Clarke A V (1992) <i>Building Quantities Worked Examples</i> . 3rd edn. Oxford: Butterworth-Heinemann Murray, G. P. (1997) <i>Measurement of Building Services</i> . Basingstoke: MacMillan. RICS (2018). Code of Measurement Practice . London: RICS Seeley, I. H. (1999) <i>Advanced Building Measurement (Building & Surveying)</i> . Basingstoke: Macmillan.	
Background Construction Information Service: https://go.openathens.net/redirector/bcu.ac.uk?url=https%3A%2F%2Fwww.ihssso.com%2Fukplc Royal Institution of Chartered Surveyors - http://www.rics.org/uk/	

Chartered Institute of Building - <http://www.ciob.org/>

Building magazine – case studies www.building.co.uk

https://librarysearch.bcu.ac.uk/permalink/44BCU_INST/15fig5r/alma991003059668406701

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Module Summary Information

1	Module Title	Commercial Management
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5108

5	Module Overview
<p>This module aims to facilitate both knowledge and professional practices involved in commercial management at an undergraduate level.</p> <p>The module acts as a major platform for both the quantity surveying and construction management professions in preparing you for level 6.</p> <p>This module will broaden your knowledge on different costs involved in a construction project. It encompasses cost considerations from early feasibility, final account stage, to life cycle costs. Through the module, you will also be looking into different requirements, intellectual and ethical considerations included in throughout the process.</p> <p>As part of the assessment process, you will also develop your communication, problem solving skills in providing professional advice to your client, and demonstrate the crucial role of professional reporting in terms of accuracy and honesty.</p> <p>This module may also offer an alternative assessment strategy for those who have successfully completed a placement year, at the end of level 4 and actively participated within an estimating capacity.</p>	

6	Indicative Content
<ul style="list-style-type: none"> • Early feasibility cost considerations (BCIS) • Introduction to Tendering (Decision, considerations (e.g. form of contract), stages, procedures and types) • Estimation, BQs and unit rates (NRM1 and NRM2) • Management of work packages • Value Engineering Management • Intellectual considerations for the built environment (Economics of construction, taxation and capital allowances) • Final account stage (cash flows) • BIM Impact on management of costs • Whole life cycle costs (Soft landings and facilities management) 	

7	Module Learning Outcomes		
	On successful completion of the module, students will be able to:		
	1	Identify and analyse the relationships between different costs in a construction project.	
	2	Identify and apply different stages and relationships to the estimating & tendering process.	
	3	Assess and evaluate the impact of procurement procedures on project development costs of political, legal, economic and social issues.	
	4	Appraise the impact of systems/techniques used throughout the life of a 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

1	Module Title	Advanced Valuation Methods
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5109

5	Module Overview
<p>This module develops your ability to explore the application of both traditional and contemporary discounted cash flow (DCF) techniques within the framework of property investment and occupation markets. It covers a range of topical analysis that will enable you to critically appraise and solve practical valuation issues. The level of knowledge learned from the module not only enables you to select the 'right' technique in today's market place but also challenges you to question the validity of alternative techniques in the context of identifying the risk of property valuation error. Property valuation is a cornerstone skill for the Chartered Surveyor. Thus, this module complements the programme's aim of equipping you with the necessary knowledge, understanding and skills to allow them to enter the profession whilst further enhancing your critical thinking, analytical ability and communication skills.</p> <p>The common aims which are covered by this module are:</p> <ul style="list-style-type: none">• Develop and enhance the requisite intellectual, practical and transferable skills necessary for graduates to enter relevant professional practice;• Apply academic theory in context;• Respond to the opportunities and challenges of the evolving technological, economic, social and environmental demands within which Built Environment professionals and organisations operate.	

6	Indicative Content
<p>In this module you will cover the following:</p> <p>Discounted cash flow techniques and their application to property valuation Taxation of non-domestic property Valuing investment property The role of measurement in property valuations</p>	

7	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Examine the role of measurement and inspection in valuation.
	2	Apply traditional and discounted cash flow (DCF) techniques in the appraisal of property investments.
	3	Analyse market evidence to support opinions of market value and worth in the appraisal of property investments.
	4	Apply valuation techniques for negotiation and rating purposes.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1	X	X	
2	X		
3	X	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		70
Private Study (PS) includes preparation for exams		82
Total Study Hours:		200

Module Specification

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Module Summary Information

1	Module Title	Data and Decision Making
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5111

5	Module Overview
<p>This module provides an opportunity for you to develop and apply research skills in a property development, planning and real estate context. The module is an introduction into some of the data, techniques and approaches required to explore social, economic, environmental and technological change in a built environment context. The module comprises two parts:</p> <ol style="list-style-type: none"> 1) preparatory sessions, involving a mix of lectures and self-directed study that provide you with the necessary background information, qualitative and quantitative techniques and data to successfully undertake the field class; 2) field visit, which will run over several days and consists of a series of staff-led sessions and individual / group project exercises. <p>The preparatory sessions will involve a mixture of lectures and self-directed study; this will provide background information to undertake the field visit. As part of this module, you will critically reflect on the following topics:</p> <ul style="list-style-type: none"> • What are the strengths and weaknesses of different approaches to conducting research in a property development, planning and real estate context; • What are the key principles of quantitative data analysis, and qualitative research; • How can new data be collected during fieldwork visit? How might we best use information to reach evidence-based decisions? • How can messages be communicated for different audiences? • Recognise the role of communication skills and the importance of working in an inter-disciplinary context, and the importance of negotiation, mediation, and advocacy and leadership skills. 	

6	Indicative Content
<p>The roles and uses of quantitative and qualitative data in decision making within the Built Environment Utilising mixed method approaches to decision making in the Built Environment The strengths and weaknesses of official and unofficial data in decision making 'Big Data' and its implications for human and machine based decision making. The role of social media and internet based data in supporting decision making. Making data accessible to enhance stakeholder engagement and public contribution to built environment decision making. Recording accurate and relevant field notes to a professional standard. Survey & structured interview design, implementation and analysis.</p>	

Combining quantitative and qualitative data through SPSS and other software.
Mapping quantitative data.
Mapping qualitative data through SPSS and other techniques
Recognising the value of data to make informed, evidence based decisions.

7	Module Learning Outcomes		
	On successful completion of the module, students will be able to:		
	1	Identify and analyse information, ideas and arguments relevant to a property development, planning and real estate context.	
	2	Demonstrate the ability to reach appropriate, evidence based decisions.	
	3	Make effective use of evidence and information sources and formulate responses to a range of property development, planning and real estate challenges.	
	4	Demonstrate the ability to use negotiation, mediation, and advocacy and leadership skills.	

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1			X
2	X		
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		60
Private Study (PS) includes preparation for exams		92
Total Study Hours:		200

Module Specification

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Module Summary Information

1	Module Title	Integrated Digital Design - Commercial
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5113

5	Module Overview
<p>The benefits of automation and digitalisation have steered government reforms globally towards embedding digitalization throughout architecture, engineering, construction and operations sectors. For example, the UK government's strategy 'Digital Built Britain 2025' is an ambitious plan to digitise these sectors. This strategic vision has similarly been enacted via the BIM Level 2 mandate to extend digitized design, construction and asset handover for commercial developments.</p> <p>Against this backdrop, this module aims to provide a foundation for you to successfully develop a Digital Execution Plan (DEP), understand BIM processes, develop commercial project documentation, and achieve interdisciplinary understanding of roles and responsibilities on a single simulated commercial project.</p> <p>This module builds upon the level 4 module 'BNV4104 Integrated Digital Design: Residential' and allows you to further your understanding of working in a BIM environment working towards UK and international standards for productive and sustainable construction.</p>	

6	Indicative Content
<p>An essential part of this portfolio coursework is the ability to develop a digital execution plan in the context of your professional discipline.</p> <p>The culmination of work conducted during the module will produce an individual (discipline specific) digital execution plan for a client on a new commercial scheme. The client will be a major contractor who will provide the BIM specifications, the client brief to assist students with producing the coursework.</p> <p>There are three interrelated aspects of the project coursework, namely: i) defining the coursework itself (and practitioner support available for such); ii) developing project documentation and strategy for a DEP which will expand the student's knowledge of digital construction in practice; and iii) coursework assessment and feedback.</p>	

7	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Effectively apply current UK development standards on a commercial BIM project.
	2	Identify and apply required skills and attributes of a professional practitioner and team member in the digital AECO sector.
	3	Identify and employ appropriate processes of defining, manipulating, extracting and embedding relevant information from BIM models in a discipline specific context.
	4	Select and employ sustainable standards and practice in a BIM environment.

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		92
Private Study (PS) includes preparation for exams		60
Total Study Hours:		200

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Module Summary Information

1	Module Title	Property Asset Management
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5115

5	Module Overview
<p>This module seeks to appraise the principal ways of managing the physical property from the perspective of operational asset management for a variety of property sectors. Property asset management is one of the core functions of a real estate professional. In addition the module will explain the principles of corporate (occupier) property management.</p> <p>The aim of this module is to enable you to apply knowledge gained in different property subject areas to conceptualise and implement programmes for operational and asset management purposes. The module also explores space demand drivers and contemporary issues in sustainability and property accountancy which are consistent with the programme's philosophy of providing would be Chartered Surveyors with the technical knowledge and understanding required by professional bodies such as the RICS. Furthermore, the module will enable you to develop critical investigation skills in solving problems in a professional context.</p>	

6	Indicative Content
<p>Module covers:</p> <ul style="list-style-type: none"> Introduction to module Corporate Strategy and Property asset analysis Space management including onsite method of measurement Introduction to lease analysis Maintenance management Property accountancy - Financial Property accountancy - Operating Corporate real estate (occupier) strategy Corporate social responsibility Sustainable factor and asset management KPIs and Benchmarking Property Asset Management and Technology innovation 	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
1	Evaluate corporate (occupier) property management decisions.
2	Formulate property asset management strategies in an institutional context.
3	Apply property asset management techniques to deal with the core concerns of managing the physical aspects of an operational property.
4	Prepare and deliver a quality property asset management report to an industry standard.

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	

Module Specification

Module Summary Information

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1	Module Title	Smart Policies and Plans
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5117

5	Module Overview
<p>This module encourages you to explore what a 'good' policy or plan with SMART objectives looks like, paying attention to both process and outcome. This is crucial to your full understanding of a planning system and the principles are relevant to any scale from local to international. This module explores the 'vertical' connections between different mechanisms / policies / plans and the 'horizontal' connections between spatial policy frameworks and other non-spatial strategies. In particular, it unpicks the legal, regulatory and policy frameworks that guide development and investment, and the relationships between spatial planning and other strategies that inform public policy intervention, including politics, stakeholder behaviour, climate change policies / agreements, energy and transport infrastructure plans, housing strategies, and sustainable community strategies.</p> <p>Through the module you are encouraged to identify and describe current / relevant policy developments for the built and natural environment. You will also practice to interpret relevant dimensions of plan making and policy application in a development and planning context. The module helps you to develop analytical and professional writing skills and introduces useful, current frameworks and criteria for assessing current policy challenges, policies and plans.</p>	

6	Indicative Content
<p>Spatial planning, strategic planning, local and neighbourhood planning Plans and policies at different scales (e.g. climate change, transport, housing) Multilevel governance Ecosystem Approach (including ecosystem services and natural capital concepts) and associated toolkits</p> <p>Different assessment frameworks (e.g. SWOT, DPSIR) Sustainable Appraisal and Strategic Environmental Assessment</p>	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
	1 Appraise the factors that shape a good plan or policy within the built and natural environment
	2 Appraise the process of policy development at international, national, regional, and local levels
	3 Apply appropriate frameworks to examine contemporary policies and plans
	4 Examine the relationship between Spatial Planning and Ecosystem Assessment in the delivery of effective plans and policies

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	70	
Private Study (PS) includes preparation for exams / completing coursework	82	
Total Study Hours:	200	

Module Specification

Module Summary Information

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1	Module Title	Integrated Digital Design for Complex Structures
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5120
5	Semester Taught	2

6	Module Overview
<p>In the construction industry, there is a continual strive toward the more integrated processes in order to maximise value, improve productivity and achieve better quality. As one of the integrated processes, Building Information Modelling (BIM) can be recognised as one the revolutionary process that provides built environment professionals with the insight and tools to support planning, design, construction, and management of buildings during the whole life cycle. In this module, you will advance your knowledge and skills of processes, technologies and requirements that underline BIM and how it is implemented in construction projects with particular focus on complex structures such as commercial, purpose-built or refurbishment projects.</p> <p>You will be given a real construction project in which you will become increasingly aware of your own profession's impact and integration within the BIM process. Using UK BIM Framework, you will become familiar with latest government guidance, reflecting best practices from the industry, and be able to justify the use of BIM for a project.</p> <p>The assessment delivery will be in the form of Individual Report, and Group Presentation, which you will present to an industry panel. For a successful completion and understanding of this module, you are encouraged to plan your own work schedules, manage your own time and refer to many case studies available in the literature and online resources.</p>	

7	Indicative Content
<p>The learning for this module incorporates formal lectures including presentations, seminars, hands on experience, client facing delivery, project based activity, and knowledge applied activities within an interdisciplinary and international setting.</p> <p>The main content of the module will be as follows:</p> <ul style="list-style-type: none"> • BIM standards and processes based on UK BIM Framework. • Roles and Responsibilities of different stakeholders within the BIM process. • Information and workflow Management within the BIM process reflecting on best practices from industry. • Outline legal requirements for BIM adoption and implementation in a project. • Apply the use of different BIM-assisting technologies including common data environments (e.g. BIM 360), 4D BIM, 5D BIM and 6D BIM. <p>Evaluate the value and impact of applying use of different technologies and tools to assist BIM.</p>	

8	Module Learning Outcomes
On successful completion of the module, students will be able to:	
	1 Identify the processes and standards that underline integrated project delivery for a construction project.
	2 Identify the role and integration of different stakeholders in a common data environment.
	3 Apply appropriate digital technologies that support design, construction, handover, operation and maintenance.

	4	Evaluate the tools and techniques used to support enhanced collaboration among a range of stakeholders involved in the design and development process.
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9 Module Assessment			
Learning Outcome Number (from table 8)	<i>Coursework</i>	<i>Exam</i>	<i>In-Person</i>
1, 2	X (60%)		
3, 4			X (40%)

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>Lectures and seminars for 12 weeks</i>
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE	62	<i>You will be set a project with a series of tasks to complete in class and in your own time as directed by the module team. On-line activity Graduate+ peer learning external visits</i>
Private Study (PS) includes preparation for exams	90	<i>You will be expected to continually work on your project and engage in using Moodle and other resources provided in the module documentation and expand into other self-selected resources as appropriate.</i>
Total Study Hours:	200	

11 Key Texts and Online Learning Resources
<p>UK BIM Framework. Available at: https://www.ukbimframework.org/standards-guidance/</p> <p>Liston, K., Sacks, R., Teicholz, P. and Eastman, C. (2011) <i>BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors 2nd Edition</i>, Wiley, London.</p> <p>Saxon, R. (2016) <i>BIM for construction clients</i>. RIBA Publishing: London</p> <p>Shepherd, D. (2016) <i>BIM management handbook</i>. RIBA: Newcastle upon Tyne.</p> <p>Sands, J. (2015) <i>The BIM roadmap: a building owner's guide to implementing BIM</i>, BSRIA.</p> <p>Barnes, P. and Davies, N. (2014) <i>BIM in Principle and in Practice</i>, ICE Publishing, London.</p>

Briscoe, D. (2016) *Beyond BIM*. Routledge, London.

Lennart, A. (2016) *Implementing virtual design and construction using BIM: current and future practices*. Routledge: New York.

Sell, P. and Pittard, S. (2016) *BIM and quantity surveying*, Routledge, Abingdon.

Essential access to academic publications from internationally reputable journals such as *Automation in Construction*, *The American Society of Civil Engineers publications*, *Advances in Engineering Software*, *Safety Science*, *Accident Analysis and Prevention* and *Facilities*.

Recommended (Currently not available on BCU campus library services)

Most necessary resources related to the module are accessible, but students are also advised to read case studies from the following journals (some may be requested from library Inter-library loans):

- Automation in Construction
- Procedia Engineering
- Engineering, Construction and Architectural Management
- Journal of Engineering, Design and Technology

Students are also encouraged to seek resources from Scopus and Sciencedirect.

Background

Autodesk Design Academy Student Online resources:

<https://academy.autodesk.com/curriculum/architecture>

You should also gain access to LinkedIn Learning resources (<https://www.linkedin.com/learning/>) for full access to online teaching material relevant to Built Environment courses. This resource contains thousands of software training videos required for the completion of this module for all its disciplines.

You will also benefit by registering onto Research Gate to identify the latest research published by internationally leading academics in the field.

Module Specification

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Module Summary Information

1	Module Title	Civil Engineering Applications
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5121
5	Semester taught	S2

6	Module Overview
<p>In accordance with the course philosophy and aims, this module has been designed to enable you to use problem-based learning to understand the Technology of Civil Engineering and innovations now being applied. It investigates a civil engineering project from its inception to its construction and identifies the methods and techniques used in constructing a range of structures and infrastructure.</p> <p>The module follows the Civil Engineering course philosophy of developing your intellectual and practical competence in technical, managerial, economic, theoretical and environmental aspects of civil engineering. Similarly, the learning and teaching philosophy incorporates learning through formal lectures including presentations, seminars, tutorials, visits to construction sites and manufacturers and exhibitions when appropriate. Learning is practice-based, including project-based activities and considering the international dimension.</p> <p>Learning activities will incorporate formative assessment including work-related learning and problem solving, in-class tasks and seminar work. The assessment outline section below details assessment for this module by way of assignments.</p> <p>Practical work within this module includes seminars. You are encouraged to plan their own work schedules, manage their time and extend their presentational skills.</p>	

7	Indicative Content
<p>This module is largely to deliver the technology of civil engineering by giving a brief overview of a key area of the industry and in some cases carry out some basic calculations. Not to be overlooked is the absolutely essential aspect of Health and Safety, which is a key aspect of consideration in the viability of any civil engineering project. Finally, there will be time devoted to topographic surveying, as the basic skills of finding out ground levels on a site and accurately plotting all the features within it is a key basic skill for civil engineers. Even though the industry is now moving towards digital scanning techniques, the ability to quickly check a level or a location of something is crucial to working life for a civil engineer.</p>	

8 Module Learning Outcomes	
On successful completion of the module, students will be able to:	
1	Appraise the ground conditions and properties on the site of a proposed civil engineering project, by interpreting site investigation data.
2	Assess the hazards, risks and sustainability issues of civil engineering activities and propose mitigation strategies.
3	Survey an area using civil engineering surveying equipment and calculating the levels and coordinates.
4	Set out geometric shapes relating to civil engineering works, using calculations and surveying equipment.

9 Module Assessment			
Learning Outcome			
	Coursework	Exam	In-Person
1-2	Applications Report (50%)		
3-4	Surveying Report (50%)		Evidence of the in-person assessment for LOs 3-4 is included in the surveying report

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	12 x 2h lecture 6 x 2h seminar 6 x 2h practical (fieldwork)
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 2 x 16h additional preparation for each submission
Total Study Hours:	200	

11	Key Texts and Online Learning Resources
Purchase	
None	
Essential (Books/Journals/Specific chapters/Journal Articles)	
Uren & Price (2010), <i>Surveying for Engineers</i> , 5th edition, Palgrave.	
Kissam P (1971), <i>Surveying practice: the fundamentals of surveying</i> , 2 nd edition, New York, McGraw-Hill.	
Jerry A. Nathanson, Michael T. Lanzafama and P. Kissam (2017), <i>Surveying fundamentals and practices</i> , 7 th Edition, Pearson.	
Khatib, J. M. (2016) <i>Sustainability of construction materials</i> . Second edition. Jamal M. Khatib (ed.). Amsterdam, Netherlands: Woodhead Publishing.	
Bell, FG 2006, <i>Engineering Geology</i> , Elsevier Science & Technology, Oxford. Available from: ProQuest Ebook Central.	
Day, R. W. (2012) <i>Geotechnical engineer's portable handbook : with the 2012 international building code</i> . 2nd ed. Place of publication not identified: McGraw Hill.	
Christopher M. Purdy, Alena J. Raymond, Jason T. DeJong, Alissa Kendall, Christopher Krage, and Jamie Sharp. Life-cycle sustainability assessment of geotechnical site investigation. <i>Canadian Geotechnical Journal</i> . 59(6): 863-877. https://doi.org/10.1139/cgj-2020-0523	
Powell G (2016), <i>Construction contract preparation and management: from concept to completion</i> , 2 nd edition, Palgrave Macmillan.	
Newton P (1991) - <i>Structural detailing: for architecture, building and civil engineering</i> 2nd Edition, London, Macmillan Education.	
Pitman P (2001) – <i>External Works, Roads and Drainage: A Practitioner's Guide</i> Spon Press.	

Recommended

Domone P D and Illston J M (2010) – *Construction Materials: Their Nature and Behaviour* Spon Press.

Dawson S (2002) – *Architects Working Details Volumes 1 to 8*, London, Emap Construct.

Reekie F revised McCarthy T (1995) *Architectural Drawing*, 4th Edition London; Oxford Architectural Press.

Harris F (1994) – *Modern Construction and Ground Engineering Equipment and Methods* Prentice Hall.

Holmes R (1995) – *Introduction to Civil Engineering* 3rd Edition The College of Estate Management.

Rogers M (2008) – *Highway Engineering* Blackwell Publishing.

Skinner H D, Charles, J A and Tedd P (2005) – *Brownfield Sites; an integrated ground engineering strategy BRE*.

Watson J (1994) – *Highway Construction and Maintenance*, 2nd Edition Longman.

Background

Bhattacharya, Subhamoy; Alexander, Nicholas A; Lombardi, Domenico; Ghosh, Sourav (2015) – *Fundamentals of Engineering Mathematics*, ICE textbooks

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
<p>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.</p> <p>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).</p> <p>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.</p>	

6	Indicative Content
<p>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.</p>	

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

Module Specification

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Module Summary Information

1	Module Title	Advanced Design and Surveying Skills
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5126

5	Module Overview
<p>This module supports the Architectural Technologists' and Building Surveyors' need for specialisms and will see you focus on specialist professional development and allow you to build on the Level 4 Design and Surveying Skills module (or other approved study) to extend both your specialist CAD skills of computer aided drawing and contextualisation, and to develop further your building design and presentation skills.</p> <p>The module introduces advanced applications to develop and explore sustainability, urban streetscapes and building forms. It will also allow you to engage with current image creation/transformation software to create advanced display material. You will be provided an opportunity to implement professional skills appropriate to design and surveying, particularly sustainable design and then implement design decisions and focus on professional display using 2D and 3D formats.</p>	

6	Indicative Content
<p>Topics covered will include:</p> <ul style="list-style-type: none"> • Freehand communication and representational drawing skills. • Research for design decision making, and recording. • Application of 2D and 3D software for the implementation of design ideas. • Advanced visual presentation techniques and the production of design and display material. • Integration of building stability, sustainability and build economy in design. • Integration of appropriate structural form and specification. • Spatial Planning. • Production and presentation of construction drawings and building models. • Master Planning. • Communication of design decisions through physical building models. • Professional reflection, review and development in a structured format. 	

7		Module Learning Outcomes
		On successful completion of the module, students will be able to:
	1	Use advanced skills in employing a full range of creation, modifier, and transformation tools within the CAD, BIM and related software environments to produce high-quality building models and drawings within industry standard parameters.
	2	Employ skills in design decision making based on sustainable and economic build principles, and properly integrate appropriate structural and specification information.
	3	Engage in, and appropriately present, structured research information to represent design decision making and be able to justify decisions.
	4	Properly integrate information from various sources and media to produce professional design representations, and display information in a professional format.
	5	Employ appropriate self-development techniques in a professional format, to record, reflect and plan.

8		Module Assessment		
Learning Outcome				
		Coursework	Exam	In-Person
1-5		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	Civil Engineering Materials
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5132
5	Semester Taught	2

6	Module Overview
<p>This module has been designed to enable you to use problem-based learning to understand the properties, behaviour, and uses of materials of Civil Engineering.</p> <p>This module follows the Civil Engineering programme philosophy of developing your intellectual and practical competence in technical, theoretical and environmental aspects of civil engineering. The learning and teaching philosophy emphasises practical work. Laboratory activities consist a major part of the module, covering all common Civil Engineering materials. These are supplemented by seminars, group work activities, and problem-based scenarios. You are encouraged to plan their own work schedules and manage your time.</p> <p>Learning activities will incorporate formative assessment including work-related learning and problem solving, in-class tasks and seminar work. The assessment outline section below details assessment for this module by way of a portfolio of laboratory reports and other coursework.</p>	

7	Indicative Content
<p>In this module you will be covering the following topics:</p> <ul style="list-style-type: none"> • Production and properties of reinforced concrete, structural steel, structural timber, structural masonry. • Production and properties of aluminium, FRP, and bamboo. • Production and properties of non-structural civil engineering materials. • Slump test of concrete. • Compressive test of concrete. • Tensile test of steel. • Bending test of timber. • Compressive test of masonry. • Calculation of characteristic strength, modulus of elasticity, deflection, means, and standard deviation. • Comparison of theoretical and experimental properties. • Life cycle stages and modules of Civil Engineering materials. • Calculation of embodied carbon of Civil Engineering materials. • Use of Personal Protective Equipment (PPE). • Adherence to the relevant British Standards and European Norms for laboratory experiments. 	

8	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Examine the production and physical behaviour of structural and non-structural materials used in Civil Engineering.
	2	Test Civil Engineering materials in a group environment utilising standard laboratory processes.
	3	Appraise the properties of Civil Engineering materials, including environmental impact and sustainability aspects, utilising calculations and computational processes.
	4	Employ standard Health & Safety processes for laboratory experiments.

9	Module Assessment		
Learning Outcome			
	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, peer group learning, Graduate+, as specified in timetable		48	<i>2hr x 12 lectures, 2hr x 6 seminars, 2hr x 6 labs</i>
Directed Learning (DL) includes placements, work-based 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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Essential (Books/Journals/Specific chapters/Journal Articles):

Cobb, F (2015). Structural engineer's pocket book: Eurocodes, Boca Raton: CRC Press.

Gonçalves, M. Clara. & Margarido, Fernanda (2015). Materials for Construction and Civil Engineering Science, Processing, and Design, Springer.

The Institution of Structural Engineers (2020). How to calculate embodied carbon, IStructE.

Recommended:

Zhang, Haimei., Ma, Shuo., Wu, Yanyan (2011). Building materials in civil engineering, Cambridge: Woodhead Pub.

Module Specification

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Module Summary Information

1	Module Title	Operational Management
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5135
5	Semester Taught	2

6	Module Overview
<p>This module aims to deliver both knowledge and technical skills required to plan and programme activities for a construction project and to manage resources on site to achieve project success.</p> <p>The module delivers a breadth of knowledge on major areas of the construction process. This includes site set up activities, resource management, practical aspects of health and safety, accountancy of risks and risk assessment, planning and programming, data and information management, communication and management theories, and the role of Construction Design and Management (CDM) regulations within a construction project.</p> <p>It also utilises the use of software applications and recent digital processes as part of the delivery, to enable you to keep up to date with the current pace of the construction industry.</p> <p>During the assessment process, you will also develop your communication skills and problem solving skills required for achieving value for money on construction projects.</p> <p>This module provides a good foundation where both technical and practical managerial skills are combined within the construction environment.</p> <p>This module may also offer an alternative assessment strategy for those who have successfully completed a placement year, at the end of level 4 and actively participated within a planning and programming department.</p>	

7	Indicative Content
<ul style="list-style-type: none"> • Pre-contract planning • Introduction to construction sites and site management (layout, health and safety, risk management and CDM Regulations) • Overview of planning and programming techniques • Site set-up and impacts on project planning • Site investigation and reporting • Use of planning software applications (MS Project) • Data and Information management during pre-construction and construction stages • Management, communication and legal considerations during pre-construction and construction stages • Project resource planning and management (labour, plant and materials) • Progress reporting and performance measurement • Performance management on projects • BIM-based Planning and programming (4D BIM) 	

8		Module Learning Outcomes
		On successful completion of the module, students will be able to:
	1	Demonstrate knowledge and understanding of the principles of site management and health and safety implications on a construction site.
	2	Apply and demonstrate the use of programming and planning techniques and software on projects.
	3	Appraise the control of communication and reporting techniques on construction projects.
	4	Evaluate and apply different resource management techniques and their implications for project success.

9	Module Assessment		
Learning Outcome Number (from table 8)	Coursework	Exam	In-Person
1,2,3 & 4	X (Portfolio- 40% and 60%)		

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>Lecture seminar</i>
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE	72	<i>On-line activity Graduate+ peer learning external visits</i>
Private Study (PS) includes preparation for exams	80	<i>Secondary Research</i>
Total Study Hours:	200	

11	Key Texts and Online Learning Resources
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Purchase

No books to be purchased

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

- Baldwin, A. and Bordoli, D., (2014) *Handbook for construction planning and scheduling*. John Wiley & Sons.
- Calvert, R. E. (2011) *Introduction to Building Management*. 6th Edition. Butterworth.
- CIOB (2009) *Code of Estimating Practice*. 7th Edition. Longman.
- Cooke, B. and Williams, P., (2009) *Construction Planning, Programming and Control*. 7th Edition. Blackwell.
- Eastman, C., Teicholz, P., Sacks, R. and Liston, K. (2011) *BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors*. 2nd Edition. Wiley.
- Fellows, R. D., Langford, S. and Newcombe, B. (2001) *Construction Management in Practice*. 2nd Edition. Longman.
- Forster, G. (2001) *Building, Organisation and Procedures*. 2nd Edition. Longman.
- Leseure, M. (2010) *Key Concepts in Operational Management*. Sage
- Race, S. (2013) *BIM Demystified*. RIBA

Recommended

- Harris, F. and McCaffer, R. (2006) *Modern Construction Management*. Collins.
- Moore, H. (1999) *Building Production Management Techniques*. Longman.
- Reiss, G. (2007) *Project Management Demystified*. Taylor & Francis

Background
Useful Websites:

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

RIBA - <https://www.architecture.com/Explore/Home.aspx>

Module Specification

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Module Summary Information

1	Module Title	Money Matters in Construction
2	Module Credits	20
3	Module Level	4
4	Module Code	BNV5136

5	Module Overview
<p>This module aims to develop and enhance the student's knowledge and understanding of economic theories and high-level external influences impacting the construction industry.</p> <p>This module will broaden your knowledge on early estimating processes linked in to the RIBA Plan of Work and different costs involved in a construction project and encompasses cost considerations from early feasibility, final account stage, to life cycle costs. You will develop commercial management skills in construction through a theoretical and practical understanding of the monetary processes of a construction project from the initial brief through to the occupation or use of the project.</p> <p>The assessment for this module will help you to understand the effect of Economics of design on the cost of various elements of a construction project through the application of management and cost analysis techniques.</p>	

6	Indicative Content
<p>Structure of the industry and organization of construction companies</p> <p>Diversification of construction companies</p> <p>The contribution of the construction sector to the national economy</p> <p>Economics appraisal of Construction Projects</p> <p>Micro and Macroeconomics and its application to construction industry</p> <p>Economic aspects of design decisions</p> <ul style="list-style-type: none"> • Concept, shape, plan: morphology and cost • Structure and envelope • Energy and services <p>Financial Decisions and accounting</p> <p>Cash flow</p> <p>Early Feasibility cost consideration</p> <p>Whole life costing</p> <p>Value engineering management</p> <p>Intellectual considerations for the built environment (Economics of construction, taxation and capital allowances)</p> <p>International markets</p> <p>Construction companies and project insurance</p> <p>RICS Code of measurement practice</p> <p>Cost data</p> <p>Pricing books</p> <p>BCIS</p> <p>Preliminary estimation techniques</p>	

- Single rate estimation techniques
- Multi rate estimation techniques

7	Module Learning Outcomes		
	On successful completion of the module, students will be able to:		
	1	Examine macroeconomic issues at a national level and their effects on the construction sector.	
	2	Analyse economic concepts and systems and their impact on the construction industry.	
	3	Compare and contrast different techniques and calculations related to the financial appraisals of construction projects.	
	4	Identify different stages of construction projects and relationships to the estimating & tendering process.	

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

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	Emerging Digital Technologies
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5146
5	Semester Taught	S2

6	Module Overview
<p>This module is focused on the application of cutting-edge and emerging technologies in the built environment. It is designed based on the built environment industry 4.0 (Fourth Industrial Revolution) and aims to respond to the fast-growing changes in the building technology and digital technologies used in the design, construction and operation of buildings.</p> <p>The module is practical and will use collaborative mini projects with a focus on real-world scenarios and issues in the built environment industry. Throughout this module, you will be facilitated to find innovative solutions with a futuristic and pragmatic approach for the given project briefs around emerging digital technologies. The module will be delivered through a series of interactive lectures, hands-on workshops, specialist labs, group and one-to-one tutorials.</p> <p>The module will deepen your knowledge around the new possibilities that emerging digital technologies can provide the built environment industry to improve productivity, accuracy, quality and sustainability in projects. It will also provide great entrepreneurial and employability opportunities for you and give you enough tools to stand out in the job market.</p>	

7	Indicative Content
<p>The topics covered in this module include:</p> <ul style="list-style-type: none">• Industry 4.0 technologies such as IoT, cloud computing, AI and environmental sensors related to the built environment• Cutting-edge immersive digital technologies such as VR, AR and Metaverse environments• Smart sustainable cities• Building performance analysis and sustainability rating systems• Digital twin, digital twin cities and UK national digital twin programme• Advanced surveying tools such as drones and laser scanners• Advanced computational design	

8	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Demonstrate applied knowledge of emerging digital technologies in the built environment.
	2	Evaluate innovative solutions in response to the project brief, through critical thinking and critical reading.
	3	Demonstrate professional and industry-standard presentation skills using a combination of emerging digital tools and technologies.

9	Module Assessment		
1,2	Coursework (50%)		
1,3			Presentation (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 as specified in timetable		48	4hr Interactive Lecture and Practical Workshop x 12 (12 weeks semester 2)
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 (12 weeks semester 2)
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
Key Books:	
<ul style="list-style-type: none">• Sawhney, Anil; Riley, Michael; Irizarry, Javier (2020). Construction 4. 0: an innovation platform for the built environment. London;New York, Routledge.• Mason, Jim (2021). Innovating Construction Law: Towards the Digital Age. Milton: CRC Press LLC, Print.	
Online Resources:	
<ul style="list-style-type: none">• Digital Club Moodle Page• Centre for Digital Built Britain, University of Cambridge, https://www.cdabb.cam.ac.uk/	
Recommended:	
<ul style="list-style-type: none">• Underwood, Jason; Shelbourn, Mark (2021). Handbook on Driving Transformational Change in the Digital Built Environment. Hershey: IGI Global• Miller, Carolyn Hler (2020). VR, AR, and Mixed Reality (XR). Digital Storytelling. 4th ed. CRC Press. 555–614. Web.	

Module Specification

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Module Summary Information

1	Module Title	Digital Cities
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5147
5	Semester Taught	2

6	Module Overview
<p>Digital cities are an emerging concept in planning theory and practice. The move from paper-based planning, design and management systems to ones underpinned by data will transform the construction profession and the way cities operate. Future property professionals and town planners need to respond by developing key skills in analysing, gathering, and evaluating digital data in the context of policy and design by utilising available software solutions.</p> <p>Digitalisation in the planning system has accelerated with the shift to online work post-pandemic and we are increasingly thinking about the future cities as being digital. The concept is rapidly being adopted and developed by policymakers, construction professionals and planners.</p> <p>You will be given theoretical background on digital cities and planning and test professional software on a practical project focusing on a specific area. You will become increasingly aware of the digitalisation of the built environment, cities and the construction industry. Through group work, critical essay writing and presentations you will develop the self-confidence to critically reflect upon the challenges and opportunities that digital cities can present to the industry and employ innovative technological solution to policy and spatial analysis.</p> <p>The assessment delivery will be in the form of a proposal represented on poster, produced by utilising a digital software, that you will present this to an industry and academic panel. You are encouraged to work in pairs, research and collect information.</p>	

7	Indicative Content
<p>The learning for this module incorporates formal lectures including presentations, seminars, hands on experience, client facing delivery, project-based activity, and knowledge applied activities within an interdisciplinary setting.</p> <p>The main content of the module will be as follows:</p> <ul style="list-style-type: none"> • Technology and innovation in planning. • Application of professionally relevant software. • Critical thinking and reflection. • Applying theory in practice. • Smart cities and sustainability. • Research and critical reading • Professional presentation 	

Following the successful completion of this module, you will be able to demonstrate the following:

- Describe and apply the development of current digital innovations in town planning and future cities.
- Communicate the implications of the developments of digital cities to industry, colleagues, and other stakeholders.
- Develop a planning-based project based on utilisation of digital software and present it professionally.
- Evaluate theoretical and policy implications of digital planning, smart cities and digital twins in relation to processes of urban and spatial planning, focusing on the interface between town planners, public, key stakeholders and other professions.

8	Module Learning Outcomes
	On successful completion of the module, students will be able to:
1	Identify and discuss key issues and challenges to the future of the planning profession .
2	Apply appropriate digital technology in the following fields: identifying and analysing issues, design and policy evaluation and understanding spatial planning context. From available digital technologies identify those appropriate for the case study
3	Report on, and evaluate, the design and policy implications of digital planning through the application of planning software.
4	Critically evaluate the digital planning tools and techniques available and emerging to support enhanced collaboration among a range of stakeholders involved in the design and development process.

9	Module Assessment		
Learning Outcome Number	Coursework	Exam	In-Person
1	X 25%		
2,3,4			X 75%

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 and 2hr seminar
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE	62	You will be set a complex spatial project with a series of tasks to complete in class and in your own time as directed by the module team utilising profession specific software.
Private Study (PS) includes preparation for exams	90	Individual and Group work. You will be expected to continually work on your project and engage in using Moodle and other resources provided in the module documentation and expand into other self-selected resources as appropriate.
Total Study Hours:	200	

11 Key Texts and Online Learning Resources	
Essential (Books/Journals/Specific chapters/Journal Articles)	
<ul style="list-style-type: none"> Boland, P., Durrant, A., McHenry, J., McKay, S. and Wilson, A. (2021). A 'planning revolution' or an 'attack on planning' in England: digitization, digitalization, and democratization. <i>International Planning Studies</i>, pp.1–18. doi:10.1080/13563475.2021.1979942. Mattern, S. (2021). <i>A City Is Not a Computer Other Urban Intelligences</i>. Princeton University Press. ISBN 9780691208053 Mitchel, W.J. (1997). <i>City of Bits: Space, Place and the Infobahn</i>. Cambridge, Massachusetts: Mit Press. ISBN 9780262631761 Wilson, A. and Tewdwr-Jones, M. (2021). <i>Digital Participatory Planning</i>. Routledge. ISBN 9781032041179 	

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1	Module Title	Technological Design Studio 2
2	Module Credits	20
3	Module Level	5
4	Module Code	BNV5151
5	Semester Taught	S2

6	Module Overview
<p>This practical module is focused on the technical and technological aspects of designing a sustainable commercial building.</p> <p>In this module, you will work towards developing building technology aspects (including building services and systems, building structure, sustainability and building performance) of a commercial project. The key aim of the Technological Design Studio 2 module is to design and create suitable technology solutions that are well-integrated with the architectural design of the building.</p> <p>As part of this module, you will study and critically analyse various precedents and consider broader influential parameters (economic, social, contextual, environmental and legal) to shape a proposal. 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.</p> <p>Technological Design Studio 2 is delivered through a series of workshops, inspirational lectures, and studio-based teaching. 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 technology ideas to a broader audience. You will be provided with an opportunity to apply the knowledge and skills gained through other modules in a real-world scenario as an architectural technologist.</p>	

7	Indicative Content
<p>The topics covered in this module include:</p> <ul style="list-style-type: none"> • Building services and systems • Building structure • Building performance and BREEAM • Sustainability and sustainable development goals • RIBA Plan of Work Stage 4 • Technical detailing, construction materials and the outline specification • Modern construction methods and innovative building materials • Socio-economic factors affecting design and construction • Responding to client brief in the context of broader environments and requirements • Professional practice and career development • Architectural presentation 	

8 Module Learning Outcomes	
On successful completion of the module, you will be able to:	
1	Employ a range of digital applications to populate the design model of a commercial project in line with RIBA Plan of Work Stage 4.
2	Identify and employ knowledge to incorporate structural design, building systems, and services into a commercial project.
3	Produce technical details that demonstrate the application of construction technology, building performance criteria and sustainability features in a commercial project.
4	Demonstrate key competencies and skills for effective presentation of detailed design solutions to a variety of audiences.

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

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Module Summary Information

1	Module Title	Contract Practice
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6119

5	Module Overview
<p>Further deepening your knowledge and understanding of contract law and procurement, this module will provide you with the hands on experience of designing and executing a contract, which is a core requirement of you, as a construction professional.</p> <p>This module will introduce you to the various forms of contracts and the responsibilities of the people involved in executing a contract.</p> <p>We will pay particular attention to roles of the key people and clauses in FIDIC, JCT and NEC3 contracts. Issues such as clauses on the provisions for extension of time, managing change, and resolution of disputes arising in the execution of contracts will be covered.</p> <p>The module will also focus on the causes and consequences for breach of contracts and procedures available for dealing with such breaches.</p> <p>Particular emphasis will also be placed on Alternative forms of Dispute Resolution (ADRs) and the factors influencing the preference of any of these forms.</p> <p>The assessment will enable you to be reflective in your advice and practice, will develop your problem solving, analysis and investigation skills.</p> <p>This module may also offer an alternative assessment strategy for those who have successfully completed a placement year, at the end of level 5 and actively participated within a contract team.</p>	

6	Indicative Content
<p>The Module covers key areas such as:</p> <ul style="list-style-type: none"> • Construction contract selection. • Understanding and interpreting construction contract clauses. • The role of the different parties in construction contract including dispute resolution. • Alternative dispute resolution mechanisms. • Preparation of payments and valuations for construction projects. • Critical evaluation of health and safety from a corporate perspective. 	

7	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Critically appraise and reflect upon the choice of contract in comparison to the given alternative.
	2	Demonstrate a working knowledge of contract clauses and acknowledge the responsibilities and obligations of those involved in the application of the contract.
	3	Evaluate processes and procedures to be adhered to within the contract.
	4	Discuss the different methods of dispute resolution.

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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1	Module Title	Civils Quantification and Cost
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6121
5	Semester Taught	2

6	Module Overview
<ul style="list-style-type: none"> This module is the final module in helping to develop your core Quantity Surveying skills of quantification and cost. This module will test your ability to understand the management procedures and techniques appropriate in pricing a tender document in accordance with the RICS/CIOB. You will be required to work as managers gaining an in-depth understanding of how design and construction projects are tendered and valued through the use of internal and external sources of information. You will develop technical skills which will enable in-depth knowledge of how pricing structure of projects can be applied to cost control by tendering companies. It is expected that you will develop your own method of working and approach to the project challenges, enabling you to think creativity and developing self – confidence in your professional judgement. 	

7	Indicative Content
<ul style="list-style-type: none"> Measurement and quantification work sections of a more advanced form Standard methods of measurement for civils (CESMM) Interpreting drawings and construction details Measurement principles Development of industry standard descriptions Preparation of cost estimates for more complex work and drawings Evaluating tenders using industry software packages 	

8	Module Learning Outcomes
On successful completion of the module, students will be able to:	
	1 Produce a completed Bill of Quantities in accordance with CESMM using appropriate tools and techniques.
	2 Apply professional procedures to manage civil engineering design data and specification information
	3 Analyse contractors' tenders, adjusting for anomalies, presenting a final recommendation.

9 Module Assessment			
Learning Outcome Number (from table 8)	Coursework	Exam	In-Person
1-3	X (Portfolio)		

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	62	You will be set a complex measurement task and you will be expected to complete this within the class and in your own time as directed by the Module team.
Private Study (PS) includes preparation for exams	90	You will be expected to continually work on your portfolio aligned to the class tasks and coursework set. And engage in using Moodle and other resources provided in the module documentation and expand into other self-selected resources as appropriate.
Total Study Hours:	200	

11 Key Texts and Online Learning Resources
<p>Essential (Books/Journals/Specific chapters/Journal Articles)</p> <p>Ashworth A, Hogg K (2007) Willis's Practice and Procedure for the Quantity Surveyor.</p> <p>Barnes M (1992) CESMM3 Handbook Thomas Telford, London.</p> <p>Barnes M (1992) CESMM3 Examples Thomas Telford, London.</p> <p>Brandon, P (1992) Quantity Surveying: New Directions BSP.</p> <p>Broome J (2012) NEC3: A Users Guide; ICE Publishing.</p>

Cobb F (2008) Structural Engineers Pocket Book; Butterworth-Heinemann.

Institute of Civil Engineers (ICE) (2013) CESMM4 Handbook, Thomas Telford, London.

Institute of Civil Engineers (ICE) (2013) CESMM4 Carbon and Price Book 2013, Thomas Telford, London.

Institute of Civil Engineers (ICE) (1991) Civil Engineering Standard Method of Measurement (CESMM) 3rd Ed Thomas Telford, London.

Institute of Civil Engineers (ICE) (2005) NEC3 Engineering and Construction Contract, ICE

Publishing.

Institute of Civil Engineers (ICE) (1999) ICE Conditions of Contract Measurement Version 7th Ed Thomas Telford, London.

Spain B (1995) Taking off Quantities; Civil Engineering (Spons Price Books), Taylor and Francis.

Recommended

Seeley, I H (1989) Advanced Building Measurement (Building & Surveying)

Basingstoke MacMillan. Seeley, I H (1997) Quantity Surveying Practice MacMillan. Seeley & Winfield (1998) Building Quantities Explained MacMillan.

Background

The Royal Institution of Chartered Surveyors <https://www.rics.org/uk/>

The Chartered Institute of Building www.ciob.org.uk

The New Civil Engineer <http://nceplus.co.uk>

Building magazine www.building.co.uk

The Virtual Site at Leeds Met <http://www.leedsmet.ac.uk/teaching/vsite>

Construction Information Service: <http://www.ihsti.com/Logon/productList.aspx?authCode=1adce69>

Construction Best Practice Programme www.cbpp.org.uk BCIS online service <http://service.bcis.co.uk> Isurv <http://isurv.com/>

Module Specification

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Module Summary Information

1	Module Title	Professionalism and Citizenship
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6125

5	Module Overview
<p>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.</p> <p>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 final 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 team-work and leadership skills, and further enhance your managerial capabilities.</p> <p>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.</p> <p>The aims 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.</p>	

6	Indicative Content
<p>This module will provide a national and international context for the professional and the interplay of professions across the industry.</p> <p>The module will typically cover:</p> <p>Ethics, Codes of Conduct and the Chartered Professional.</p> <p>Citizenship and corporate social responsibility.</p>	

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.

7 Module Learning Outcomes	
On successful completion of the module, students will be able to:	
1	Compose and effectively communicate successful strategies for coping with difficult and complex situations and contexts.
2	Construct reasoned argument, advice and guidance contributing to group presentation and individual work demonstrating synthesised appraisal of multi-disciplinary stakeholders' priorities.
3	Develop a critical appreciation of consultancy, citizenship and professionalism, consequences for decisions taken and actions and inactions, and their strategic significance for an organisation's management and development.
4	Appraise appropriate professional body membership routes and requirements for membership and CPD, resulting in a Personal Development Plan.

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

Module Summary Information

1	Module Title	Property Marketing
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6127

5	Module Overview
<p>The module will introduce you to the various aspects of marketing communications tools from initial analysis of the property and market through to developing an expanding range of promotional and negotiation techniques. It will explore the use of all elements of the promotion mix with particular reference to the estate agency sector and the wider property business industries. This module will cover the main areas of advertising, personal selling, sales promotion, public relations, professional ethics and direct marketing. Attention is also given to new areas of increasing relevance such as product placement, electronic print and social media.</p> <p>An understanding of clients and consumers and their buyer behaviour will enable you to have a greater understanding of targeting individuals and groups on existing properties and new developments with new product ranges, brand positioning, target marketing and tailored communication strategies. This module will arm you in seeking to gain a career in property agency – sales and leasing, and property development, alongside the mainstream property professions.</p>	

6	Indicative Content
<p>Module covers:</p> <ul style="list-style-type: none"> Principles of Marketing Marketing concepts - Traditional advertising structures Marketing concepts - Social Media Property transactions and the marketing role - theory Property transactions and the marketing role – application Property Inspection - recording measurements, features and attributes Property market analysis Property reporting/advertising skills advertising Communications strategies Effective negotiations and selling skills 	

7	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Evaluate the principles of marketing with reference to the different aspects of property.
	2	Formulate effective negotiation skills in a property transaction context.
	3	Evaluate the importance of building features and attributes in a marketing framework.
	4	Synthesize strategies for property marketing and communication to provide viable property marketing solutions.

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

Module Specification

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Module Summary Information

1	Module Title	Commercial Building Pathology and Surveying
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6130

5	Module Overview
<p>The module is designed to enhance your existing skills in the core technical competencies of building surveying: building pathology, inspection, & legal and regulatory compliance as applied to commercial and industrial buildings.</p> <p>The identification, analysis and formulation of solutions are key to the pathological aspects of the module whilst identification and employment of the most appropriate survey methods as well as analysis of the legal implication in the condition and use of the building for the property owner allow for a coherent approach to providing clients with professional advice.</p>	

6	Indicative Content
<ul style="list-style-type: none"> • Dilapidations including landlord and tenant law. • Due diligence. • Access audits. • Fire risk assessments. • Party walls. • Pre-acquisition surveys. • Condition surveys. • Reinstatement cost assessments for insurance purposes. • Dealing with fire and flood damaged properties. • Stock condition surveys. • Non-destructive testing. • Schedules of condition. 	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
	1 Appraise and evaluate defects in commercial and industrial buildings in respect of adaptation, alteration and effective use of a commercial building.
	2 Critically analyse the use and condition of buildings relating to the legal requirements for occupation and operation of commercial and industrial buildings.
	3 Appraise options for undertaking commercial surveys and determine appropriate action.
	4 Interpret client's instruction and produce a professional quality report.

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

Module Specification

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Module Summary Information

1	Module Title	Geotechnical Engineering
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6132
5	Semester Taught	2

6	Module Overview
<p>In accordance with the programme philosophy and aims, this module has been designed to enable you to use problem-based learning to understand the principles of geotechnics and their application to design and construction of civil engineering projects. It will enhance the knowledge and ability to work in teams and lead teams including the aptitude to work independently and understand the importance of being a reflective and innovative professional.</p> <p>The module presents the fundamentals of shallow and deep foundations, site investigation techniques, retaining structures, slope stability and ground improvement. These concepts rely on the understanding of the main principles of soil mechanics, in particular the compressibility and shear strength of soils. The learning and teaching philosophy incorporates learning through formal lectures including seminars, tutorials, hands-on experience, software applications, problem-based scenarios, and site visits when appropriate.</p> <p>Learning activities will incorporate formative assessment including work-related learning and problem solving, in-class tasks and seminar work. The assessment outline section below details assessment for this module by means of an examination.</p> <p>Practical work within this module includes practical demonstrations, seminars, laboratory and tutorial work, use of ICT as a visual tool, problem-based scenarios and group project work.</p>	

7	Indicative Content
<p>1. Estimate soil parameters and properties relevant to applied geotechnical design using site investigation techniques.</p> <ul style="list-style-type: none"> • Elements of soil mechanics. • Site investigation. • Ground improvement. <p>2. Design geotechnical structures to meet the demands of real world situations.</p> <ul style="list-style-type: none"> • Retaining structures. • Shallow foundations. • Deep foundations. <p>3. Evaluate the stability and sustainability of geotechnical systems and structures.</p> <ul style="list-style-type: none"> • Retaining structures. • Shallow foundations. 	

- Deep foundations.
- Settlement analysis
- Slope analysis.
- SLOPE/W tutorial.

4. Assess the settlements of geotechnical solutions with regard to serviceability.

- Shallow foundations.
- Deep foundations.
- Settlement analysis

8	Module Learning Outcomes		
	On successful completion of the module, students will be able to:		
	1	Estimate soil parameters and properties relevant to applied geotechnical design using site investigation techniques.	
	2	Design geotechnical structures to meet the demands of real world situations.	
	3	Evaluate the stability and sustainability of geotechnical systems and structures.	
	4	Assess the settlements of geotechnical solutions with regard to serviceability.	

9	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	30%	70%	

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	10 x 2h lecture 10 x 2h seminar 2 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	
<i>None</i>	
Essential (Books/Journals/Specific chapters/Journal Articles)	
Knappett, J. and Craig, C.F. (2020) – <i>Craig’s Soil Mechanics</i> . 9 th Edition. CRC Press.	
Powrie, W. (2014). - <i>Soil Mechanics: Concepts and Applications</i> . 3 rd Edition. E & F N Spon.	
Recommended	
Bowles, J. (1997) – <i>Foundation Analysis and Design</i> . McGraw-Hill.	
Clayton, C.R.I., Matthews, M.C. and Simons, N.E. (1995) – <i>Site Investigation: A Handbook for Engineers</i> . Blackwell Science.	
Powrie, W. (2014) - <i>Solutions Manual for Soil Mechanics: Concepts and Applications</i> . 3rd Edition. E & F N Spon.	
Background	
<i>None</i>	

Module Specification

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Module Summary Information

1	Module Title	Advanced Analysis and Design Methods
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6134
5	Semester Taught	2

6	Module Overview
<p>In accordance with the course philosophy and aims, this module has been designed to enable students to use problem-based learning to understand the philosophy and application of a range of advanced methods employed in the analysis and design of Civil Engineering projects. These include the advanced learning of infrastructure design and analysis, incorporating the advanced numerical and computational techniques (finite element method and finite volume method). This module also introduces key concept of traffic engineering and transportation where students would be able to learn and design transportation and traffic system using onsite data analysis.</p> <p>The module follows the Civil Engineering course philosophy of developing the intellectual and practical competence of students in technical, theoretical, numerical and environmental aspects of civil engineering. Similarly, the learning and teaching philosophy incorporates learning through formal lectures, seminars, tutorials, and problem-based scenarios, backed up by guest industrial speakers, when appropriate.</p> <p>Learning activities incorporate formative assessment including work-related learning and problem solving, in-class tasks, and seminar work. The assessment outline section below details assessment for this module by way of coursework.</p> <p>Practical work within this module includes practical demonstrations, seminar, and tutorial work, 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.</p>	

7	Indicative Content
<p>1. Examine the design safety of infrastructure using advanced computational concepts and techniques.</p> <ul style="list-style-type: none"> • Failure criteria • Design optimization • Computational Mechanics <p>2. Design infrastructure elements utilising computational mechanics software</p> <ul style="list-style-type: none"> • Mechanics of Material and Design • Computational Structure Mechanics • Computational Fluid Dynamics (CFD) • Fluid-structure interaction (FSI) <p>3. Evaluate traffic data using key concepts of traffic engineering.</p> <ul style="list-style-type: none"> • Traffic flow analysis 	

- Traffic emission analysis

4. Design a transportation system using the systems analysis approach.

- Equilibrium analysis
- Utility-Cost functions
- Four-step model transportation forecast

8	Module Learning Outcomes	
	On successful completion of the module, students will be able to:	
	1	Examine the design safety of infrastructure using advanced computational concepts and techniques.
	2	Design infrastructure elements utilising computational mechanics software.
	3	Evaluate traffic data ,calculate traffic emissions, and discuss the impact of transport on the climate emergency.
	4	Design a sustainable transportation system using the systems analysis approach.

9	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-2	Design and Applications Report (50%)		
3-4	Design and Applications Report (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 as specified in timetable	48	12 x 2hr lecture 12 x 2hr seminar
Directed Learning (DL) includes placements, work-based learning, peer group learning external visits, on-line activity, Graduate+, peer learning, as directed on VLE	28	2 x 2hr guest lectures 12 x 2hr directed learning which includes critical reading, online learning, Moodle material and peer learning.
Private Study (PS) includes preparation for exams	124	12 x 8hr self-study 2 x 14hr additional preparation for each submission
Total Study Hours:	200	

11 Key Texts and Online Learning Resources
<p>Purchase <i>All from the list below that are not currently in the library</i></p> <p>Essential (Books/Journals/Specific chapters/Journal Articles)</p> <p>Fenner, Roger T and Reddy, J.N. (2012). Mechanics of solids and structures, Boca Raton, Fla.:CRC Press.</p> <p>O.C. Zienkiewicz, R.L. Taylor, J.Z. Zhu (2013). The Finite Element Method: its basis and fundamentals. Amsterdam: Butterworth-Heinemann, Elsevier.</p> <p>Rainald Löhner (2008). Applied Computational Fluid Dynamics Techniques: An Introduction based on Finite Element Methods. Chichester: John Wiley.</p> <p>Sigrist, Jean-Francois. Fluid-structure interaction: An Introduction to Finite Element Coupling. Chichester, England: Wiley, 2015.</p> <p>Elmi Hami, Abdelkhalak, Radi, Bouchaib. Fluid-structure interactions and uncertainties: Ansys and Fluent tools. Hoboken, New Jersey: ISTE Ltd; John Wiley and Sons Inc., 2017.</p> <p>Khisty, C.J. and Lall, B.K. (2003) Transportation Engineering: An Introduction. Third Edition. Prentice Hall.</p> <p>Mannering, F.L., Kilareski, W.P., and Washburn, S.S. (2004). Principles of Highway Engineering and Traffic Analysis. Third Edition. John Wiley & Sons, Inc.</p> <p>Meyer, Michael D. and Eric J. Miller. Urban Transportation Planning, Second Edition, McGraw Hill, 2001. ISBN-13: 978-0071200004</p>

Recommended

Goodno B and Gere J (2018). Mechanics of Materials, 9e. Cengage Learning

John D. Anderson (1995). Computational Fluid Dynamics: the basics with applications, New York; London: McGraw-Hill.

Background

John D. Anderson (1995). Computational Fluid Dynamics: the basics with applications, New York; London: McGraw-Hill.

An Introduction to Computational Fluid Dynamics: The Finite Volume Method (2nd edition), H. Versteeg and W. Malalasekera, Pearson Prentice Hall, 2007.

Module Specification

Module Summary Information

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1	Module Title	Research in Practice
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6136

5	Module Overview
<p>For this module you will be investigating a named site; using common research methods discussed in class you will gather data on various elements of the site and impacting on the site. This module dovetails with the Design Project module: the site for that module and this will be the same. This will ensure the applicability of the research you do for Research in Practice. During the module, contemporary issues of sustainability in the built environment will also be covered, as potential elements to be included in future design work. The use of an applied project to develop research skills and enhance specific knowledge of contemporary issues in this way means this module fits well with the overall programme philosophy of 'problem based learning' or a 'flipped curriculum'. In so doing, it develops and enhances the transferable skills essential for the modern professional.</p>	

6	Indicative Content
<p>Introduction to research and research methodologies Ethics, reflection and referencing Observation Site visit Concept mapping Quantitative Methods – Interviews Secondary sources Coursework help</p>	

7	Module Learning Outcomes
On successful completion of the module, students will be able to:	
1	Plan and manage a variety of types of data collection in a professional and ethical manner.
2	Access, retrieve and evaluate primary and secondary information from a range of appropriate sources pertinent to a potential development site.
3	Communicate the process and findings of research in written and / or graphical form to a professional standard, with the findings applied to the potential development site.
4	Reflect critically on the undertaking of research and information finding.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1, 2, 4	X		
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
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	Sustainable Building Design and Construction
2	Module Credits	20
3	Module Level	6
4	Module Code	BNV6204

5	Module Overview
<p>The module explores and applies sustainable architectural engineering principles to the construction, planning and design of buildings / structures in order to create a sustainable built environment.</p> <p>Through the study of the principles and pillars of sustainability, structural integrity of buildings, construction technologies, and energy management issues, the module seeks to promote the construction management process as a part of a creative, practical and interdisciplinary / collaborative approach, with involvement from the earliest stages of the design process, to consider new and evolving sustainability demands from all stakeholders and the use of sustainable materials and assembly techniques based on the need for more sustainable buildings.</p> <p>The module provides you with an understanding of the principal applications of sustainable techniques to the design and construction of building services to commercial and industrial buildings; reinforcing the need for co-ordination of the building services installations within the overall construction process whilst integrating environmental technology into sustainable building solutions.</p> <p>The module actively encourages you to consider building design and building services, where you will explore and develop an understanding of the design and analysis of heating, ventilating and air conditioning systems, acoustic and lighting planning, together with the study of the efficiency and design of plumbing, fire protection and electrical systems. You will explore in a manner that reflects the need to meet the vital requirement for constructive teamwork in a modern and complex construction industry.</p> <p>You will undertake a design/management exercise, which requires you to address many of the different aspects of environmentally sensitive/informed design and management with emphasis on contributing to sustainable construction. This will help develop and deepen your understanding of the importance of sustainable design and construction of the built environment taking account of and enhancing the natural and built environment for the benefit of the future generation.</p>	

6	Indicative Content
<p>Architectural design principles. Energy management. Sustainable Construction Carbon footprints Design Management Renewable energy, net-zero carbon buildings. Smart materials and technologies. Distributive Services: cold and hot water supply systems, Waste management systems. Principles of heat, thermal comfort, buildings and thermal behaviours.</p>	

Passive vs Active Design and Active Control.
 Daylight. Solar control. Principles of light and vision.
 Principles of Acoustic design.
 Environmentally sustainable technology.
 Sustainable waste management

7 Module Learning Outcomes	
On successful completion of the module, students will be able to:	
1	Evaluate how creative design and engineering methodologies are integrated into a sustainable design for a site/building.
2	Appraise and select appropriate thermal, acoustic, lighting and ventilation strategies and incorporate them into building.
3	Appraise and select appropriate H-VAC, fire safety strategies and principles of waste management in the design and construction of a building.
4	Evaluate the challenges in integrating services, maintenance and the health and wellbeing of occupants.

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

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 Assessment will be enabled through a series of small scale, problem-based workshop, by working both in groups and individually, during seminar sessions where both formative and summative feedback will be provided. These interactive activities enable you to develop conceptual understanding and accumulate knowledge and skills to enable you to apply those skills to a 'real life' building / scenario project. You should be able to distinguish elements of their theoretical learning, select and organise them, and integrate the learning in a structured manner within a practical project and present such with confidence to peers, tutors and construction industry representatives.
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	62 A practical application of commercial and industrial building services with a focus on sustainable practice and energy management applied to a new build extension and/or refurbishment of an existing commercial building.
Private Study (PS) includes preparation for exams	90
Total Study Hours:	200