

Course Information Sheet

BSc (Hons) Construction Management

Mode and course length – Full-Time (4 years)

Location – ARU Cambridge Campus

Awarding Body – Anglia Ruskin University. As a registered Higher Education provider Anglia Ruskin University is regulated by the Office for Students.

Overview

Location of study:

Level 3 – ARU Cambridge Campus

Level 4-6 – ARU Chelmsford Campus

From day one you'll begin to gain the skills, knowledge and understanding you need to become a chartered construction professional of the future, readily able to take on the challenges and opportunities found within our built environment.

The construction industry is one of the most dynamic, diverse and significant in the world. We live, work and play in the built environment, and our Construction Management course will develop your skills, knowledge and understanding of both the technology and management involved in its creation across the key stages and process of planning, construction and maintenance. These range from building design and technology, to the management of resources (people, materials and equipment), to the assurance of the health, safety and wellbeing of the workforce, to the administration of projects and stakeholder engagement, all as they are carried out within contemporary regulatory, legal, economic, and social contexts, and with reference to the latest thinking in sustainability and developments in digital technologies and Building Information Modelling (BIM).

You'll use our specialist facilities including industry-standard surveying equipment and a dedicated computer suite offering the latest in CAD, 3D Modelling, project management and financial software. During the course you will also develop your communication, numerical, IT, teamwork, analytical and problem solving skills within a Built Environment context. Students are also encouraged to attend the various professional body CPD events regularly held here at ARU, to begin to develop your own industry networks and meet other young professionals from the region.

We look forward to welcoming you onto our Construction Management course here at ARU and supporting you on your way to becoming a construction professional of the future.

Course Delivery

Our courses are delivered through teaching and learning methods which provide students with the widest possible exposure to a modern and innovative higher education experience.

These methods vary and could include attendance at lectures and seminars, undertaking laboratory exercises or work-based activities, practical work, performances, presentations, field trips, other relevant visits and e-learning through Canvas, our online learning management system.

Each course is divided into a number of 'modules' which focus on particular areas, each of which has a specific approach to its delivery. This information is published to students for each module they take via the Module Definition Form (MDF) and Canvas.

Assessment

Throughout the course, we'll use a range of assessment methods to help measure your progress. Besides exams, you'll be assessed on your project work, case studies, reports, workplace assessments and presentations.

Fees

Information about your course fee including any annual fee increases or deposits (if required) can be found in your offer letter.

Additional Costs

Safety footwear (steel toe and midsole) - £40

General stationary and calculator - £100

Poster printing - £20

Additional costs for Residential Week

You will be asked to make a contribution of £250 towards the cost of food and accommodation. You will also be asked to provide your own safety shoes or boots and warm outdoor clothing. Other personal protective equipment will be provided.

Modules

Core Modules

Year 1: Foundation in Engineering, Computing and Technology

This module will provide students with the necessary skills to begin studying at level 4 in Engineering, Computer Science and related courses.

Students will be introduced to the core skills necessary to succeed in higher education, including thinking critically, researching and referencing appropriately, demonstrating appropriate numeracy and ICT skills, and communicating effectively verbally and in writing.

In addition to these fundamental skills, Students will cover the subjects underpinning the technological disciplines. Fundamental mathematical skills will be covered, alongside pre-calculus, followed by an introduction to calculus and vector and matrix arithmetic. Students will also be introduced to Classical mechanics, and its application to real-world scenarios. Students will be introduced to the fundamentals of computer science, learning about the principles behind programming and applying them through a series of practical coding exercises. Students will undertake a multi-disciplinary group project as they learn about the collaborative nature of engineering, and design from a broader perspective of business.

The module is made up of the following 8 constituent elements:

- Interactive Learning Skills and Communication (ILSC)
- Information Communication Technology (ICT)
- Critical Thinking
- Maths for Scientists
- Maths for Engineers
- Physics for Engineers
- Fundamentals of Computing
- Engineering Design

Year 2: Site Management and Safety

This module provides students with an introduction to the principles and application of management as they relate to the technical and professional disciplines of the construction industry. They will gain understanding of management principles and their relevance to the processes of design, construction and maintenance of the built environment. They will also learn how these principles may be applied to the management of construction through case studies. Students will consider the process of setting up a site and the importance of planning and organising work. Non-adversarial multi-discipline team working will be examined. The module provides students with opportunity to examine health and safety issues within the construction industry and their

integration throughout the processes of design, tender award and construction. The roles of all parties involved are explored from both moral and legal viewpoints. Past and current attitudes will be discussed. Students will consider the safety record within the construction industry and identify health and safety legislation aimed at reducing accident rates. The process of hazard identification and risk assessment will be explained with students producing method statements following on from their risk assessments. Safe systems of work are identified enabling students to relate theory and practice. Employability Skills - Students will use the information in the module when working within the industry.

Year 2: Construction Economics

Students will also gain an understanding of basic microeconomic and macroeconomic principles and how they impact on firms in the Built Environment. This allows students to develop an appreciation of the importance of the economy on the industry in which their careers are located. The learning experience combines formal lectures with workshops and tutorial discussion to provide a foundation of understanding. Students are also expected to read not only text material but also web-based source material to gain an appreciation of current issues and debates. Students should be able to demonstrate in their assessment that they have undertaken their own research following guidance from the module leader. The employability skills developed in this module are the ability to read and understand abstract concepts and to be able to write coherently about economic issues. Also students should be able to work independently.

Year 2: Building Technology

This module is designed for students of construction, surveying and architecture with little and/or no prior knowledge of building construction, services and material properties. Students will learn the common materials and methods of construction of both new and traditional housing, by considering in turn each of the main elements of the buildings' structure. They will also study the requirements of the internal environment, so as to understand how services installations contribute to user comfort. Other basic aspects such as the personnel involved, health and safety requirements and specialised terminology will be illustrated as appropriate to support this.

Employability skills Students will acquire knowledge related to domestic construction and be able to justify why different materials are used in the built environment. As well as improving their intellectual skills they will also develop communication skills.

Year 2: Elementary Survey Skills

This module is intended to develop the necessary site related survey skills for students entering the construction industry. Students will gain both a theoretical understanding as well as hands-on practice in the use of both traditional and contemporary instruments in order to set-up and control the most common elements of construction.

Survey work is one of the most complete and satisfying disciplines involved in construction because it involves the application of theoretical knowledge to solve practical problems using tactile skills and common-sense in the field.

Following brief theoretical introductions and backed up by student managed pre-reading and preparation, much of the module content will be experienced out of doors. As time is limited and weather conditions unpredictable, students should be prepared to dress appropriately and attend all timetabled classes. There will be little if any time for repeat sessions or to catch up on missed experiences.

Students will be expected to display a hands-on competence in order to pass a number of practical tasks in the field as well as be able to perform the basic off-site calculations necessary to be able to prepare site/quality/survey documentation to satisfy specified tolerances and employer requirements. To quote a former student, "there's nowhere to hide and no-one gets a free ride".

The skills gained in this module are those which the most junior of site engineers and site managers will be expected to perform and are therefore of immeasurable value in employability terms.

Year 2: Introduction to Civil Law and Legislation

This module introduces built environment students to the structure and processes of the English legal system, to the sources of the law, and to those basic legal concepts and skills which such students need to address more detailed legal issues in later modules. It is the essential foundation to the development of the legal skills necessary in the provision of sound advice to clients

in a student's professional career. The module will focus in particular on the English Civil Law, as this is the branch of the law most relevant to students both in subsequent law modules and in professional careers after completing the surveying degree course. However, certain Criminal Law topics will be included where these are necessary to understand or draw a distinction between processes in the two branches of the law. The essential purpose of this module is to benefit students who may not have had the opportunity to study law previously. It will provide guidance to students on information, materials and sources to equip them with a basic understanding of the nature and structure of the English legal system, Parliament and law making, the court structure and precedent, legislation and case law, and legal terms and language. Students will be guided to legal sources and materials, and will be taught how to research law appropriate to their studies, using both published references and internet resources. A key aim of the module is to develop the students research skills, specifically in the field of legal issues affecting their work, together with their ability to analyse research material, and to marshal material and facts into cogent advice and reports. Whilst this introductory module will focus on the English law, it will provide an insight into the growing importance of the European context affecting English law

Year 2: The Built Environment Work Sector

This module is intended to support the development of understanding of the nature of the work sector in the broadest sense including the environments in which the sector operates, its performance within these contexts and factors that influence the operation of organisations. Students will cover the generic work together as a whole group focusing on the role of the professions in the built environment sector and opportunities for employment and career progression. The students will then split into different subject specialisms. Construction Management, Construction and Design, Building Surveying, Real Estate Management, Property and Surveying, Quantity Surveying students Students will examine man in his environment and his attempts to control the development of society politically, socially and economically through the medium of land use in both organic and planned terms from earliest civilisation to the present day. Multicultural perspectives and issues within Built Environment is discussed. The module introduces the student to the complications of the present day structure of the building and development industry including the roles of the leading participants and the development of the organisation by examining the historic growth of the systems up to the present day situation. Civil Engineering students Students will cover earthworks and groundwork techniques together with the principles and practice of earth-moving plant selection, safety, cycles and economics. Soil stabilisation techniques of dynamic consolidation, vibratory systems and grouting are also included as well as foundations suitable for these systems. In addition conventional piled foundations will be covered. Temporary and permanent support techniques, such as cofferdams; contiguous piling and diaphragm walls are discussed. Long-span low-rise and medium rise structures will be discussed in terms of material selection, construction methods, foundation types and the performance of different of claddings.

Year 2: IT and Communications

Students entering Higher Education will need specific study skills to enable them to maximise their learning potential and take advantage of opportunities available both in the academic setting and workplace. The module is intended to be both preparatory and supportive, building a strong foundation for learning and later development. Students will gain Information and Communication Technology (ICT) skills for information management and presentation purposes and will be encouraged to use contemporary ICT methods for research and for the production and presentation of reports, in a style suitable both for university coursework requirements and the commercial environment.

Year 2: Elements of Construction Design

This module is designed for students of construction, surveying and architecture to introduce them to some of the basic analytical concepts and processes involved in the design of structures. Students will develop analytical skills which will allow them to carry out basic structural calculations

Students will also be introduced to basic 2D drafting techniques using industry standard software. This will allow them to effectively interpret technical drawing and give them the skills which can be applied to their specialist discipline area in later modules. Skills in this medium are highly sought after in the construction industry. BIM will be introduced to the student and students will gain an appreciation of technology and the role of the designer in the construction process and have an understanding of the design process.

Year 3: Advanced Construction Technology

This advanced technology module is designed to develop students' technical knowledge and the skills to apply that knowledge in

the context of both new build and refurbishment work. The focus of this module leads on from domestic construction and provides a broad understanding of the way we build commercial and industrial buildings. The module will consider the functional requirements of single-storey industrial sheds and multi-storey framed structures in concrete and steel. In addition, the effects of the latest legislation in relation to fire and health & safety on the construction process are examined. A great deal of guidance is given to students on skill development. The application of Building Regulations and the associated Approved Documents to both commercial and industrial buildings will be explored. Students will compare different construction methods, and analyse suitable applications for each method. In particular, frames, cladding systems, internal walls, structural flooring and roofing will form key areas of the module.

Environmental performance is a central part of this module and students will investigate how to ensure high levels of environmental performance through using insulation, maintaining airtightness and the installation of building services and controls. Students will have the opportunity to compare the installation requirements of natural and forced ventilation systems and different methods of heating and cooling commercial and industrial buildings. The provision of high quality IT and communications infrastructure systems will also be investigated.

Year 3: Procurement and Costing

This module intends to introduce an understanding and appreciation of the commercial aspects of construction work for construction managers. The importance of the selection and application of various procurement routes will be considered, alongside the factors required to be considered at tender adjudication. The way costs are subsequently managed on an ongoing basis throughout the construction phase of the project will be explored, with emphasis on the role of the construction project manager within this process.

Practical skills in interpreting drawn and written information will be developed, enabling the quantification and measurement of a range of construction and civil engineering activities. Students will develop the analytical processes necessary for accurately assessing the cost of such works in accordance with the relevant standard forms of measurement (with a focus on the RICS New Rules of Measurement), throughout the project life-cycle, enabling the computation of accurate costs (both direct and indirect), including relevant commercial factors and risk etc.

Year 3: Construction Planning and Programming

This module examines the process of production planning for construction works, analysing the use of production planning techniques and how they may aid the construction process. It analyses production planning techniques such as programming of the works using bar charts, method statements and resource scheduling. The module also enables the student to prepare cash flow forecasts based on their production programmes and the effect that such forecasts may have on the project. The module is project based and of a practical nature, which allows the student to use the above project planning techniques in a 'live situation' generated by the case study, where the student will be given the opportunity to react to simulated events during the project life cycle such as delays and disruptions to the works.

Year 3: Environmental Building Performance

This module has been designed to give the students an insight into the scientific basis of the environmental performance and construction of buildings and their services. The main focus is on the introduction of modelling tools that can be used to simulate a building's performance and its effect on the environment. The main approach adopted is a scientific one, focusing on the analysis of a problem or set of problems, followed by the synthesis of a solution. Considerable emphasis is placed on the use of environmental criteria to assess a building's thermal, visual and aural performance. A number of scientific methods are explored and there will be a limited amount of practical experiment-based work. Various technical solutions for lighting, heating, ventilation and air conditioning a building will be explored. The passive design features of a building are also explored.

Students will be introduced to standard methods of assessing and measuring the environmental performance of buildings, such as Passivhaus and BREEAM.

This module makes extensive use of Canvas to develop students understanding of the core module material and to provide formative assessment opportunities.

Year 3: Project Administration

This module is designed for construction students with a general background in construction subjects and who wish to learn how to manage and administer a building contract from a legal and economic standpoint. Students will learn how contracts are constructed, be able to interpret their contents and manage the more routine legal and financial aspects through the completion of a contract and its final account. Students will learn through problem solving and case study activity that simulates a live project and the likely circumstances that arise. It is a module which has direct application to practice and will be of value in terms of the student employability.

Year 3: Construction Resource Management

Module is designed to allow students to study and acquire the theories, skills and competencies applicable to identify and manage the resources required to operate a construction organisation and in particular the development process. Students will develop a number of key management skills which enable efficient project and organisational situations to be changed. Students will be expected to appreciate and understand how the macro economic environment affects the way managers design micro economic systems and from this manage resources. Systems theory is used to help students understand how organisations function and is used to support organisational design decision making. Supply chain management is examined in some detail with case studies from other industries used as a focus for improving approaches adopted in construction. A broad understanding of financial management, in a construction context is developed. The way in which financial resources are measured, administered and reconciled in a systematic fashion will be studied by students. Students will be given the opportunity to evaluate the significance of how the human resource is procured, retained and motivated. An appreciation of the relative merits/demerits of the construction industry when compared to other industries will be developed with particular emphasis on employment and motivation. Employability Skills: Analytical skills will be developed via the use of financial appraisal techniques, budgetary control tools and cashflow forecasting systems. Risk management with particular focus on health and safety appraisal of business and project scenarios. Structured problem solving and decision making will be at the heart of studies in this module.

Year 3: Ethics and Professional Practice

This module seeks to explore the growing consideration of ethics and professionalism within the construction industry context.

Fundamental to good construction business is the need to recognise the moral and ethical issues that sit alongside the planning, creation, and endurance of a built environment that recognises the diversity of user needs and is able to ensure inclusivity for all. The module will explore contemporary ethical issues in construction industry, with specialist guest speakers included within the programme where beneficial.

Framed by the Chartered Institute of Building's Code of Conduct, professional practice will also be examined, and used to enable students to reflect on both their own practices and those which they find within the wider construction industry. This process will result in the production of a personal development plan, an 'exit plan' from the degree course, which will support students as they progress towards chartered status.

Application of this understanding of professionalism and ethics will then be applied to academic enquiry. Students are encouraged to develop their ideas around contemporary construction issues and explore how ethical research is necessary for good academic practice. This will culminate in the students producing an examination of a specific contemporary issue of their choice, and proposing a method for its ethical enquiry in practice, following Anglia Ruskin University Ethics Procedures. If the students wish, this can be then used as the foundation for the Major Project module in the future.

Year 4: Major Project (Construction Management)

This module represents the culmination of each student's development through learning undertaken on their programme. It provides an opportunity for students to demonstrate their ability to undertake a substantial original study to investigate a subject, issue, or problem and to produce a usable outcome. Students carry out an original piece of work that may be either an expert study or a research study. Advice will be offered on choosing a research topic and producing a proposal in a briefing session delivered towards the end of the academic year prior to that in which students undertake the project.

The project will be undertaken under the supervision of an academic member of staff but the early part of the module in trimester one is also supported by taught classroom sessions. These taught sessions enable students to develop research and study skills in respect of reviewing and analysing literature, developing a research question, collecting, presenting and analysing data, and managing the research process.

In addition to the taught sessions, a minimum of four supervision tutorials will take place during the academic year in which the module is studied. It is each student's responsibility to make contact with their tutor to arrange appointments. 5% of the marks for the dissertation/major project are for attendance and performance at these tutorials which must be recorded in an appendix to the dissertation.

Year 4: Project Management

This module is designed to develop the students' knowledge of basic management theories, and to demonstrate their relevance and application in the planning, organisation and control of construction projects. Students will be encouraged to research appropriate theories, skills and competencies related to the life cycle of a project from the client's conceptual vision, through the project identification and definition stages, applying appropriate project implementation, execution and control processes to effect successful closure of a project. The module aims to change the students vision from a contract administration viewpoint to the broader perspective required in the project management approach. For many students this will involve standing back from their everyday role on a project, and to consider the holistic integrated nature of the project management role on a construction project. Thus, whilst recognising the value of many of the skills acquired by students in the contract administration modules, the module will develop the specialist techniques which question the usual functional and organisational boundaries. Students will be encouraged to develop an appreciation of the strategic relevance of project management, and the unique features of project management which distinguish it from other forms of management. Students will be required to research and develop operational techniques used in the planning, scheduling and control of projects to demonstrate that they understand the processes and mechanisms necessary to ensure the effective delivery of the project objectives.

Year 4: Running a Construction Business

This module is designed to enable students to acquire the knowledge and competencies to run a contracting organisation in a highly volatile economic environment. Students will use a computer simulation package, which allows them to run a construction business using real world data, Students will work in teams when running the simulation, and will analyse organisational data, with each student required to produce an individual report. However, the key aim of this module will be to develop an understanding of how to make changes and decisions in a business strategy so to meet tactical organisational objectives. Students will need to also study financial management in some depth to gain an understanding of how financial data is converted into usable information identifying historical performance, which can be interpreted as part of a manager's decision-making toolkit. Students will become familiar with the statement of cash flows, the income statement and the statement of financial position and their usefulness in assessing the amount of wealth created and the accumulated within the business. For this purpose there will be collaboration with the Bloomberg Lab, Lord Ashcroft International Business School. It will be important to acquire a range of analytical skills which enable students to measure company performance from a number of standpoints and to be critical of the way a company has performed with reference to its desired objectives in the context of the prevailing economic climate. Ancillary to this aim will be the acquisition of a critical awareness of the way in which organisations function within an environment made up of threats, opportunities and constraints.

Year 4: Environmental Management for the Construction Industry

The growth in environmental awareness, at all levels from local to international, over recent decades is introduced and considered in the context of the construction industry. Legislation and other pressures for the protection of the environment are considered, including pollution control and environmental impact assessment. The advantages and disadvantages of formal and informal environmental management systems are examined. Design implications of concepts such as life cycle analysis are considered. It is intended that the student should, by the end of the module, look at environmental management, not as a burden, but as a fundamental part of the efficient management of the construction industry. Such an outlook is likely to enable the student to guide their present or future employers towards a sustainable future.

Year 4: Construction Technology and Innovation

This module has been designed for stage 3 students, so as to capitalise on previous technology modules. It will consist of a series of lectures together with structured tutorial sessions. The lectures will focus on a particular topic whilst the tutorial sessions will be used to allow the students to work in small groups. These tutorial meetings will be formally conducted within accepted procedures, and their content will be properly recorded in minutes. In the lecture sessions the focus will be on current construction issues and trends of a technological nature. Methods of special construction will be critically reviewed. The module culminates in a formal presentation, during which the students are encouraged to use a variety of illustrative methods to support

their work. This is backed up by written proposals containing elements of both group and individual work. Employability skills Students will acquire knowledge related to current construction issues and special forms of construction. They will also demonstrate an understanding of alternative forms of construction. The module will improve their communication, team building and intellectual skills as well as developing professional awareness.

Year 4: The Strategic Construction Entrepreneur

This module aims to develop students' entrepreneurial skills within the context of the contemporary construction industry. The students will develop their knowledge and understanding of current industry contexts (e.g. relating to local and global markets, and wider political and economic climates), industry initiatives (e.g. Lean, BIM, digital construction, AI, collaborative cultures, ethics), and industry practices (e.g. H&S strategy, zero harm, corporate social responsibility, sustainability, supply chain integration). This module will be delivered in the form of 12 seminars with industry experts (which includes the lecturing team), with student-led debate and discussion strongly encouraged during the sessions. From their enhanced position, students will then be able to suggest strategic directions, new avenues of opportunity and potential markets for entrepreneurial development, from start-up, SME and larger organisational perspectives.

Assessment within this module will mimic some of the fundamental challenges of working in construction, thereby enhancing students' employability skills whilst enabling them to demonstrate their knowledge understanding through a Time Controlled Assignment (TCA).

Year 4: Project Evaluation and Development

The module provides the student with the opportunity to explore the various issues that need to be evaluated when considering a building development from inception until final completion and retention and / or disposal of the building. The context and content of this module integrates knowledge and skills obtained from previous management and design modules. It examines them in a holistic manner and explores their complex inter-relationships. Issues related to the client, the site, planning, financial appraisal, design technology, legal, health and safety and environment will all be examined within a theoretical and practical framework. The module develops the student's ability to comprehend the totality and implications of the development process and to make reasoned value judgements as to its potential feasibility. This is achieved by a detailed examination of local planning policies for the site coupled with a financial analysis of the proposed scheme by use of traditional and modern forms of valuation techniques. The module also focuses on project appraisal, pre construction processes, construction and post construction processes, marketing disposal and evaluation. The module is project based with studio teaching which is undertaken by various strategies such as formal group lectures, group seminars and individual tutorials. Site visits are arranged where appropriate to underpin student knowledge and understanding of practical issues. Joint staff and student criticisms and presentations occur throughout the delivery. Employability skills Students will assess a site for future development opportunities in a manner that satisfies a potential client's need in terms of financial reward, design, procurement, management and cost in use or final disposal of the completed project. Students will improve their communication skills both in terms of report writing and oral presentations to their peers and tutors. Analytical skills will be developed through employment of financial appraisal and risk management strategies.