Graduate Apprenticeship

Course Overview

Graduate Apprenticeship in BSc (Hons) Construction and the Built Environment

Scott Sutherland's School of Architecture and the Built Environment

Graduate Apprenticeship (GA) courses provide structured training to degree level with flexible delivery which wraps around the needs of business.

Robert Gordon University, Aberdeen (RGU) GA courses are designed to meet the national frameworks developed by Skills Development Scotland (SDS).

SUBJECT TO VALIDATION

May 2018

Skills Development Scotland

European Union gov.scot

EUROPE & SCOTLAND
European Social Fund
Investing in a Smart, Sustainable and Inclusive Future

RGU ROBERT GORDON UNIVERSITY ABERDEEN

COURSE OVERVIEW

Graduate Apprenticeship in BSc (Hons) Construction and the Built Environment

AWARDING AND DELIVERY INSTITUTION

The Robert Gordon University

AWARD TYPE AND DURATION

Undergraduate, four years

MODES OF STUDY

Full Time Blended Learning [work-based learning, virtual learning environment (VLE)]

LANGUAGE OF STUDY AND ASSESSMENT

English

AWARDS

On successful completion of each stage the student will receive the following award:

Stage 1: Higher Apprenticeship in Cert HE Construction and the Built Environment

Stage 2: Higher Apprenticeship in Dep HE Construction and the Built Environment

Stage 3: Graduate Apprenticeship in BSc Construction and the Built Environment

Stage 4: Graduate Apprenticeship in BSc (Hons) Construction and the Built Environment

Indicative Student Workload	Hours/ Module
Contact Hours	30
Non-Contact Hours	30
Placement/Work-Based Learning Experience [Notional]	240
Hours TOTAL	300
Actual Placement hours for professional, statutory or regulatory body	240

COURSE STRUCTURE

Blended Learning			
Stage 1		*CREDITS*	*LEVEL*
SU1050	The Construction Industry: An Introduction	30	7
SU1051	Building Design and its Determinants	30	7
SU1052	Construction Project Management	30	7
SU1053	Building Design and Technology	30	7
	Total for Stage:	**120**	

Blended Learning			
Stage 2		*CREDITS*	*LEVEL*
SU2050	Construction Procurement, Contracts and Law	30	8
SU2051	Construction: Technologies, Methods and Implications	30	8
SU2052	Project Planning, Execution and Control	30	8
SU2053	Integrated Construction Project	30	8
	Total for Stage:	**120**	

Blended Learning			
Stage 3		*CREDITS*	*LEVEL*
SU3050	Management of Design and Construction	30	9
SU3051	Building Pathology	30	9
BS3009	Business Finance and Accounting	30	9
SU3053	Managing Complex Projects	30	9
	Total for Stage:	**120**	

Blended Learning			
Stage 4		*CREDITS*	*LEVEL*
BS4006	Strategic and Commercial Management	30	10
SU4051	Dissertation	30	10
SU4052	Professional Practice Project	60	10
	Total for Stage:	**120**	

Stage One

The Construction Industry: An Introduction	Ref SU1050

AIMS
To provide the students with the contextual background to the construction industry and its allied professions, and its relationship to practices and processes within the built environment.

LEARNING OUTCOMES	
1.	Understand how construction design solutions vary for different types of buildings.
2.	Report on the impact of different design strategies on cost and programme.
3.	Understand the stages of design and construction from inception to completion.
4.	Identify factors that may affect project implementation within the construction industry.
5.	Critically reflect on the core content of the module and examine its application within the work place including ethical, professional and sustainable practices, health and safety and professional attributes.

INDICATIVE CONTENT
Trends and legal framework, role within the economy, project stages, collaborative working, risks, health and safety, digital agenda, ethical practices, stakeholders, design approaches and processes.

Building Design and its Determinants	Ref SU1051

AIMS
To provide the student with an understanding of the processes involved in building design, and the range of drivers, determinants and variables that influence design solutions.

LEARNING OUTCOMES	
1.	Understand how construction design solutions vary in different contexts.
2.	Understand the impact of different design solutions and construction methods on cost and programme.
3.	Understand alternative construction details in relation to functional elements of the design.
4.	Critically reflect on the core content of the module and examine its application within the work place including ethical, professional, and sustainable practices, health and safety and professional attributes.

INDICATIVE CONTENT
Building typologies, construction methods, process performance, construction sustainability.

Stage One

Construction Project Management	Ref SU1052

AIMS
The module will provide an introduction to the principles of construction project management and discuss techniques and processes necessary to manage a project to cost, time, quality, safety and environmental requirements.

LEARNING OUTCOMES	
1.	Understand the systematic management of the construction processes as they relate to a project from inception to completion, applying industry standards processes, methods, techniques and tools to procure and execute projects.
2.	Apply fundamental knowledge and principles of the commercial, economic and global context in which projects are undertaken.
3.	Understand the role of the construction manager in leading the construction project team including defining the roles and responsibilities and successfully managing client expectations.
4.	Understand the nature of risks associated with initiating and implementing a construction project and the methods and techniques used to measure and manage risk.
5.	Critically reflect on the core content of the module and examine its application with in the work place including ethical, professional, and sustainable practices and professional attributes.

INDICATIVE CONTENT
Construction processes and project stages, including demolition and recycling. Value management and value engineering, procurement and commercial considerations. Construction team, role, responsibilities and stakeholder management, risk identification and risk management.

Building Design and Technology	Ref SU1053

AIMS
To provide the student with the ability to understand and apply the key principles of construction techniques, construction detailing, built asset maintenance, refurbishment, renovation and associated data management.

LEARNING OUTCOMES	
1.	Make recommendations on the choice of design and construction solutions for projects recognising the influence of environmental services and strategies for optimising levels of human comfort and building performance.
2.	Explain the influence of building maintenance and lifecycle cost on building design, components and elements.
3.	Demonstrate knowledge, understanding and application of the structural and construction principles, systems, and methods relating to domestic scale and non-domestic scale buildings.
4.	Apply sustainable thinking and techniques in relation to design and specification of sustainable materials.
5.	Critically reflect on the core content of the module and examine its application within the work place including ethical, professional, and sustainable practices, health and safety and professional attributes.

INDICATIVE CONTENT
Structure and construction principles in contemporary use will be explored, along with a range of materials and new methods of construction. Understanding and application of 3D modelling and the principle of data management (BIM) are introduced. Building maintenance, refurbishment and rehabilitation requirements will be examined along with the requirements for any temporary works including a brief introduction to conservation issues. Structural materials - properties and environmental impact; timber, steel, reinforced concrete, plain and reinforced masonry, glass; alternative structural systems - simple frames, portal & moment frames and load bearing walls; vertical and lateral loading; lateral stability including diagonal bracing, shear walls and moment connections; integration of structure and architectural design; basic structural theory in relation to tension, compression, bending, shear and deflection; application to the approximate sizing of simple beams, continuous beams, cantilever beams, composite beams, trusses, slabs, columns and walls. Consideration of the interaction between environmental and human factors, which can impact on component, assembly and whole building performance.

Stage Two

Construction Procurement, Contracts and Law	Ref SU2050

AIMS
To provide the student with the ability to understand and apply the principles of traditional and alternative procurement methods, contract administration procedures and Scots Law and to assess administrative and legal principles in a built environment context.

LEARNING OUTCOMES	
1.	Analyse and compare traditional and contemporary procurement practice.
2.	Analyse and appraise the use of appropriate standard form clauses and procedures applied to common financial and managerial situations encountered within a built environment situation.
3.	Analyse prequalification and reporting of tender submissions prior to entering into a formal contract.
4.	Correctly apply knowledge and understanding of the basics of Scots contract law and reparation law in the context of the built environment.
5.	Critically reflect on the core content of the module and examine its application within the work place including ethical, professional, and sustainable practices and professional attributes.

INDICATIVE CONTENT
This module will explore the selection and use of modes of procurement and relevant contract types (to include minor forms) applicable to the built environment and tender processes. It will also explore standard contract administration within the built environment associated with selecting the appropriate contractor, financial control and contract administration. An analysis of specific contractual terms, trends and developments will be studied as will issues of construction contract administration. A focus upon Scots Law in relation to the law of contract and reparation.

Construction: Technologies, Methods and Implications	Ref SU2051

AIMS
To provide the student with the ability to recognise and propose alternative sustainable construction solutions and assess their impact on operations, maintenance, and lifecycle costs.

LEARNING OUTCOMES	
1.	Understand alternative construction details in relation to functional elements of the design.
2.	Design systems, which integrate building structure and envelope while considering issues of whole life cycle and building pathology where applicable.
3.	Provide reasoned advice on the policy, law, and best practice of sustainability in their area of practice.
4.	Formulate environmental strategies for optimising levels of human comfort and building performance.
5.	Critically reflect on the core content of the module and examine its application within the work place including ethical, professional, and sustainable practices, health and safety and professional attributes

INDICATIVE CONTENT
Alternative sustainable design solutions and construction processes and their impact on cost, maintenance, and lifecycle cost.

Stage Two

Project Planning, Execution and Control	Ref SU2052

AIMS
To critically assess, within a problem solving environment, the techniques, tools, processes and strategies undertaken by project managers to define, plan, evaluate, monitor, control and deliver project requirements.

LEARNING OUTCOMES	
1.	Use different planning techniques, assess and evaluate the differing tasks' time, cost and quality requirements to produce a project delivery plan within a goal oriented environment.
2.	Appraise and assess resource scheduling and allocation techniques within a project environment including application of network diagrams, critical path analysis and resource levelling.
3.	Appraise key project evaluation monitoring and control techniques including Earned Value Management, and their importance in bringing projects to successful completion.
4.	Review and apply the various IT project management led techniques, viewed as contemporary project management tools.
5.	Reflect on the core content of the module and examine its application within the work place including ethical, professional, and sustainable practices, health and safety and professional attributes.

INDICATIVE CONTENT
Planning fundamentals and overview; work content and scope management; WBS; time and cost estimation; project budgeting; resource management; project monitoring and control; earned value; IT tools for project planning and control; change control; quality systems and post project reviews, data management, storage and analysis.

Integrated Construction Project	Ref SU2053

AIMS
To provide the student with the ability to integrate and consolidate knowledge and understanding from studies conducted throughout Stages 1 and 2.

LEARNING OUTCOMES	
1.	Appraise technology and management solutions and any other factors which may influence time, cost and quality upon a real life project.
2.	Apply knowledge of appropriate construction technology within the context of the project.
3.	Identify and apply the appropriate procurement method and the standard form of contract to the project.
4.	Identify the health, safety and environmental issues involved in the project.
5.	Advise on appropriate plan and programme of resources, including a cost plan, required to successfully complete the project.

INDICATIVE CONTENT
The module facilitates the integration of topics delivered at Stages 1 and 2 by guided application of best practice techniques to a real life project. Organisational and economic factors will be viewed in the context of flexible and efficient construction practices. Design technology and construction will be integrated within a design context; with emphasis on a safe, environmentally responsible practical application and clear customer focus. Individual and team working activities will be encouraged.

Stage Three

Management of Design and Construction	Ref SU3050

AIMS
To equip students with the facility to develop creative and effective techniques for managing the effective delivery of design and construction projects relating to the built environment.

LEARNING OUTCOMES	
1.	Discuss and critically evaluate the management of design and construction in historical and contemporary contexts.
2.	Investigate and develop innovative management solutions for realising project objectives through linking design with construction.
3.	Understand and identify performance and productivity issues and propose viable solutions.
4.	Evaluate and apply standards for project health, safety, welfare, environment and quality management.
5.	Critically reflect on the core content of the module and examine its application within the work place including ethical, professional and sustainable practices, health and safety and professional attributes.

INDICATIVE CONTENT
The module will investigate traditional, contemporary and innovative models for managing design and construction relating to built environment. Students will initiate and develop research based projects which demonstrate an understanding of the contexts within which design and production management operates. The use of IT is central to investigating and problem solving design and construction management scenarios. performance and productivity management, waste control, and lean construction.

Building Pathology	Ref SU3051

AIMS
To provide the student with the ability to critically analyse and diagnose the mechanisms of decay and deterioration of buildings and to devise remedial strategies for repair, maintenance and rehabilitation works with a view to prolonging the life of a building.

LEARNING OUTCOMES	
1.	Understand the detailed pathology of buildings and the related defects, causes and remedies.
2.	Apply knowledge of different types of testing and their limitations in order to select appropriate methods.
3.	Evaluate and explain the cause of failures and give recommendations on appropriate remedial measures.
4.	Synthesise knowledge and information gathered from inspection(s) to produce schedule(s) of work.
5.	Critically reflect on the core content of the module and examine its application within the work place including ethical, professional, and sustainable practices and professional attributes.

INDICATIVE CONTENT
This module will explore the process associated with biological, chemical and physical building deterioration. The student will study the process of inspection, diagnosis and prognosis of building defects and prepare a number of repair strategies. This module will also explore how the deterioration of the different elements of the building are interconnected and often lead to progressional failure. The module will investigate different levels of intervention strategies and how they are influenced by client restrictions as well as the building's functional, performance, user and statutory requirements. Health and safety of occupants will be investigated within the context of hazardous and deleterious materials and students will investigate their statutory responsibilities when they are required to deal with such materials. Financial planning of maintenance budgets will be explored as will alternative procurement strategies. Financing of maintenance works will be explored including sinking funds, insurances and loss adjusting.

Stage Three

Business Finance and Accounting	Ref BS3009

AIMS
To develop the ability to identify and evaluate the nature, context and format of financial information of companies and to apply appropriate financial techniques for decision making and control.

LEARNING OUTCOMES	
1.	Demonstrate understanding of key accounting concepts and the financial reporting environment.
2.	Identify and apply appropriate accounting techniques that support financial analysis and decision making for different business scenarios.
3.	Evaluate the effectiveness of a range of financial techniques for investment appraisal and the control of financial resources.
4.	Critically evaluate appropriate sources of finance for a variety of business scenarios.
5.	Critically reflect on the core content of the module and examine the application of key accounting and finance techniques within the work place.

INDICATIVE CONTENT
Accounting concepts; company accounts; capital structure; funding sources; ratio analysis; budgeting and costing; working capital management; investment appraisal; business case and financial viability.

Managing Complex Projects	Ref SU3053

AIMS
To develop within students the ability to recognise the factors that contribute to complexity within projects and equip them with the critical ability to develop creative and effective approaches to manage such projects.

LEARNING OUTCOMES	
1.	Determine the components and characteristics of complex projects in comparison to traditional and functional management.
2.	Understand and identify performance and productivity issues related to complex project and propose viable solutions.
3.	Critically evaluate and apply standards for project health, safety, welfare, environment and quality management.
4.	Critically reflect on the core content of the module and examine its application within the work place including ethical, professional and sustainable practices, health and safety and professional attributes.

INDICATIVE CONTENT
The module will consider all issues related to complex projects including success factors, resources, teams, and engagements. Participants will consider integration management, scope management, time management, cost management, human resource management, procurement management, quality, risk, and communication management from the perspective of complex project and initiate and develop appropriate solutions for the benefit of the project.

Stage Four

Strategic and Commercial Management	Ref BS4006

AIMS
To provide the student with the knowledge and skills required to effectively manage the commercial and organisational issues relevant in the context of the construction industry.

LEARNING OUTCOMES	
1.	Evaluate the drivers of change and the tools required to implement transformational change.
2.	Critically review the role of leaders in planning, implementing and evaluating strategy within a business.
3.	Explore the processes by which continuous improvement can be achieved in the construction context.
4.	Analyse the accountability of organisations and assess the role of governance and the regulatory framework.
5.	Critically reflect on the core content of the module and examine the application of strategic and commercial activity within the work place.

INDICATIVE CONTENT
The topics to be discussed include, human factors, quality management, leadership, strategic planning, training, human resource management, accountability and change in the context of the construction industry.

Dissertation	Ref SU4051

AIMS
To provide the student with the ability to further develop professional skills through undertaking a research based investigation, which addresses a specialist area of need in the built environment. The investigation should synthesise complex issues of problem identification, evaluate research material and draw valid conclusions through independent research.

LEARNING OUTCOMES	
1.	Identify and gather a thorough body of information appropriate to a chosen subject within the course discipline.
2.	Critically evaluate that information from a theoretical perspective and adopt an individual intellectual position.
3.	Construct and present a structured argument in writing, with appropriate graphic support, using and acknowledging that information in line with academic writing conventions.
4.	Develop a thorough understanding of a relatively narrow subject within the discipline.

INDICATIVE CONTENT
The module provides a framework for selecting a feasible topic and clarifying the scope of a proposal; an introduction to planning research and finding sources of information; a context for structuring and presenting written information.

Stage Four

Professional Practice Project	Ref SU4052

AIMS

To provide the student with the ability to apply the integrated knowledge, understanding and skills from studies conducted throughout Stages 1, 2 and 3 to a real life project.

LEARNING OUTCOMES

1.	Develop and present the commercial and economical business case for undertaking a project.
2.	Propose a range of appropriate technological and management solutions applicable to a real life construction project.
3.	Identify and apply the appropriate procurement method and the standard form of contract to a project.
4.	Advise on an appropriate plan and programme of work and resources required to successfully complete a construction project.
5.	Develop an appropriate and systematic plan for the robust management of project information.

INDICATIVE CONTENT

This module will investigate the nature and role of the construction professional in commercial/industry property situations. Synthesis and presentation of solutions for project design, construction, design, and management in a professional environment. Feasibility studies for property development, procurement and operation will be undertaken. Interpersonal, communication and presentation skills in the context of team working will be considered. Project solving techniques.

Scott Sutherland School of Architecture & the Built Environment

Graduate Apprenticeship in BSc (Hons) Construction and the Built Environment

Organisational Requirements	Mentor Requirements	Student Requirements	Delivery Calendar
Software Requirements: • Access to RGU Campus Moodle at work (either through a network or if this is not possible, via a tablet with data contract). • Access to Panopto • Access to Mahara (e-portfolio software) • JPA – Environmental Services and Measurement • Autodesk Suite • Costex • Asta Power Project • Microsoft Project Hardware Requirements: • Access to a PC • Headphones and microphone for participation in Blackboard Collaborate sessions • Regular use of a conference room or private space in order to participate fully & uninterrupted in Blackboard Collaborate Sessions Work-Based Learning Environment Requirements: • It is important that the Apprentice has access to a work-based learning environment which adequately represents and reflects the student's course to ensure appropriate functional expertise, supporting infrastructure and professional/technical knowledge within the organisation. • There are no requirements for laboratory facilities. • Protected time to undertake work-based learning activities, attend on-campus study days and undertake study-related activities such as participation in Blackboard Collaborate sessions.	A Workplace Mentor should be allocated to support the student throughout their degree studies, including by the creation of a Learning Plan which schedules course-relevant work-based learning activities. Ideally, a Champion Workplace Mentor will be appointed who has substantial experience of all aspects of the business and can be supported by Subject Mentors as required. The Champion Workplace Mentor will normally: • Be educated to degree level, in a discipline relevant to the Apprentice's course of study • Work in a position relevant & senior to the Apprentice's course of study • Have three years managerial/supervisory experience, at least one of these within the organisation • Have sufficient organisational oversight to assist in Learning Plan creation and execution i.e. the ability to negotiate opportunities to work across the organisation when required as part of the course) • Be able to provide resources or access to these, influence workload and project focus, and facilitate access to relevant aspects of the business • Be actively willing to mentor in a way which encourages, coaches and assists the Apprentice in their academic and professional development	All applicants must be employed in a full-time position relevant to their chosen course of study; resident and working in Scotland and have the right to live and work in Scotland. An applicant's employer must be committed to and involved in the provision of a suitable workplace learning environment, coupled with supportive workplace learning guidance and mentoring to create a setting in which the student will be able to achieve the required experience and learning outcomes. Employers must be willing to formally partner with the University via a Collaboration Agreement which sets forth the obligations of each party. <u>SQA Higher:</u> Normally BBCC to include English (or a written subject requiring the use of English). Maths or a science subject is required at National 5 grade C or above if not held at Higher. We welcome applications from those with equivalent qualifications to those stated, including Foundation Apprenticeships (SCQF Level 6), SVQs/NVQs, non-relevant HNCs, access programmes and overseas qualifications. Applications from students with non-standard qualifications or work experience will be considered on an individual basis. <u>Experiential Equivalencies</u> <u>First Year Entry:</u> For those applicants who do not meet our Standard Course Entry Requirements, applications may be considered from those who possess 4 years' relevant work experience of which 1 year is at supervisory level or higher and where the applicant has demonstrated the development of key skills evidenced through a detailed CV. Candidates will also be requested to attend an interview. <u>Advanced Entry:</u> Advanced entry may be considered for those who have minimum 4 years relevant work experience all at supervisory role or higher and where the applicant has demonstrated the development of key skills evidenced through a detailed CV. Candidates will also be requested to attend an interview. The above are broad standards provided to guide applicants who do not meet our Standard Course Entry Requirements, however in all cases admission decisions rest with the University and the relevance, breadth and depth of employment experience will be taken into consideration.	• 10-week delivery per 30-credit module • Quarterly Learning Plans to be completed by the conclusion of Week 6 of each preceding module • On-campus Mentor & Student Induction plus one on-campus contact day per module • 2 site visits per year of study • Although the preference is for on-site visits to apprentices' WBLEs,, there is an option to remotely 'visit' sites if budget, time, weather, or workload constraints interfere with the visitor's ability to travel to remote locations, particularly in the case of outlying areas such as islands or sites more than 150 miles distant from RGU. • 4 workplace mentor reviews per year of study, at the halfway point of each module • Assessments usually completed/submitted in Week 11 of each module