



**Graduate Apprenticeship in Civil Engineering
&
Graduate Apprenticeship in BEng (Hons) Civil
Engineering**

1. Programme information

Programme Title:	Graduate Apprenticeship Civil Engineering
Course Title:	Graduate Apprenticeship in Civil Engineering Or Graduate Apprenticeship in BEng (Hons) Civil Engineering
Duration:	4 years' work based learning
Accredited by:	UHI
SCQF level:	7-10

1.1. Programme aims

The Graduate Apprenticeship Civil Engineering is designed to produce graduates with:

- the ability to work in a safe and sustainable way, according to environmental requirements;
- the ability to select appropriate techniques, procedures and technology and use relevant theoretical knowledge and understanding of key concepts and materials;
- scientific and mathematical knowledge and understanding;
- skills in the use of appropriate technologies and digital platforms used in civil engineering;
- skills in the collection and critical analysis of data, combined with appropriate critical-thinking and problem-solving ability;
- the ability to plan and manage projects, including managing and monitoring risk, operating and evaluating performance and managing and allocating tasks and resources;
- the ability to critically reflect on own performance and identify areas for improvement to broaden and expand theoretical understanding and knowledge of current and emerging professional engineering practice and techniques;
- the ability to communicate with others at all levels, including when presenting and managing discussions.

The programme is designed to achieve the following general aims:

- meet the academic requirements of Engineering Technician (EngTech) and Incorporate Engineer (IEng) accreditation;
- provide the knowledge and skills in engineering, consistent with their employment as a graduate Civil Engineer;
- provide a structured work based learning programme that can be delivered flexibly using virtual learning and other innovative L&T delivery methods in partnership with the employer.

1.2. Programme content and structure

Order of these modules may vary slightly depending on timetables (see agreed timetables for confirmation)

Graduate Apprenticeship in BEng (Hons) Civil Engineering (Work Based Learning)			
		CREDIT	SCQF LEVEL
Year 1			
UH207006	Site Surveying and Communication 1	20	7
UH207003	Civil Engineering Technology 1	20	7
UH207004	Construction Materials	20	7
UH207007	Structural Mechanics and Engineering Computation	20	7
UH207005	Geotechnical Engineering 1	20	7
UH207002	Civil Engineering Project 1	20	7
Year 2			
UH208428	Mathematics for Civil Engineering	20	8
UH208426	Geotechnical Engineering 2	20	8
UH208425	Civil Engineering Technology 2	20	8
UH208429	Structural Analysis and Design	20	8
UH208427	Hydrological Engineering	20	8
UH208424	Civil Engineering Project 2	20	8
Year 3			
UH209760	Civil Engineering Measurement and Contract Law	20	9
UH209759	Applied Structural Analysis and Design	20	9
UH209763	Environmental Legislation and Sustainability	20	9
UH209764	Geotechnical Engineering 3	20	9
UH209761	Civil Engineering Project 3	20	9
Choose one of the following two modules			
UH209765	Site Surveying and Communication 2	20	9
UH209762	Civil Engineering Technology 3	20	9
Year 4			
	Planning & Project Management	20	10
	Integrated Civil Eng. Design	20	10
	Work Based Portfolio and Project	40	10
	Dissertation (Building Technology)	40	10
Total Number of Credits		480	

1.3. Unit summary

UH207006 Site Surveying and Communication **20 Credits**

This module aims to provide students with the knowledge, understanding and practical experience of terrestrial surveying, setting out and computer aided drawing practices in the construction industry. The students will be introduced to the theory, purpose, calculations required, instruments and sources of errors in typical small terrestrial surveys and simple setting out work related to construction, and communication by means of technical drawings.

There are 4 Learning Outcomes which are assessed by practical work and coursework submission. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Examples of work based evidence may include drawings (created, modified and completed by the student and approved by employer), notes, level book, calculations and photos of surveying and setting out, quality assurance forms, drawing registers, instrument check sheets etc.

UH207003 Civil Engineering Technology 1 **20 Credits**

This module aims to provide students with an awareness of Civil Engineering Technology in areas of groundwork's, external works, groundwater control and environmental impacts. This module will consider the history of civil engineering and the current opportunities in the industry. Investigation of site conditions and emerging technologies will develop research skills and use of Information Technology.

There are 4 Learning Outcomes which are assessed by a coursework submission and an open book examination. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Examples of work place evidence may include CV, Continual Professional Development and Training records, development action plan, site investigation notes, photos and records etc.

UH207004 Construction Materials **20 Credits**

This module aims to provide students with knowledge and understanding of the specification, procurement, performance and quality of construction materials. Consideration of the properties and sustainability of materials in the selection and use of various construction materials in building and civil engineering. Practical laboratory work and the use of Information Technology are integrated into the learning and assessment processes of this module.

There are 4 Learning Outcomes which are assessed by a coursework submission and an open book examination. Coursework submission may include work based evidence where

relevant to satisfy learning outcomes. Work place evidence may include method statements and risk assessments from materials testing (on-site or in laboratory), records and photos of carrying out testing, materials testing records and quality control forms, specifications etc.

UH207007 Structural Mechanics and Engineering Computation **20 Credits**

This module aims to provide students with a knowledge and understanding of structural mechanics, in order to solve problems relating to statically determinate beams and frames. Engineering communication and computations skills are integrated in the module.

There are 4 Learning Outcomes which are assessed by an open book assignment and a closed book examination. Examples of work place evidence may include design loading sheets, structural software print outs and modelling, shear force and bending moment calculations.

UH207005 Geotechnical Engineering 1 **20 Credits**

This module aims to provide students with knowledge and understanding of the formation and classification of soils enabling learners to apply the basic principles of soil mechanics to the solution of problems in geotechnical engineering. This will help learners to classify and analyse the performance of soils, plan ground improvement and design foundations.

There are 4 Learning Outcomes which are assessed by a coursework submission and an open book examination. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Work place evidence may include method statements and risk assessments from soils classification testing (on-site or in laboratory), records and photos of carrying out testing, materials testing records and quality control forms, specifications etc.

UH207002 Civil Engineering Project 1 **20 Credits**

This module will be delivered as the summative project for SCQF Level 7 studies allowing the learner to develop self-reliance to commit to the module aims and deadlines. The project focus will be a case study or live project. The learner will investigate and analyse project information to arrive at solutions to civil engineering problems defending decisions and assumptions made. Students will reflect on their solution in a technological, social, legal and economic context and on their design against a specification.

There are 3 Learning Outcomes which are assessed by coursework submissions. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Work place evidence may include project planning records, health and

safety and site set up records and forms, drawings and specifications, surveying and setting out photos and records, quality control monitoring including non-conformance.

UH208428 Mathematics for Civil Engineering

20 Credits

This module aims to provide students with knowledge and understanding of a variety of Mathematical topics underpinning various Engineering disciplines. Engineering communication and computation skills integrated into the learning and assessment of this module.

There are 4 Learning Outcomes which are assessed by an open book assignment and a closed book examination.

UH208426 Geotechnical Engineering 2

20 Credits

This module aims to provide students with knowledge and understanding of the principles of soil mechanics and shear strength of soils to apply to the solution of problems in geotechnical engineering. This will help learners to appreciate how soils will behave, produce geological maps and check the suitability of retaining structures.

There are 4 Learning Outcomes which are assessed by a coursework submission and an open book examination. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Examples of work place evidence may include method statements and risk assessments from soil properties testing (on-site or in laboratory), records and photos of carrying out testing, materials testing records and quality control forms, specifications, design calculations drawings and specification of retaining structure etc.

UH208425 Civil Engineering Technology 2

20 Credits

This module aims to provide students with an appreciation of the elements of large building, frames structures and external works including road pavement design. This module will consider the layout and design of large framed structures, construction methods, materials selection and design. The design of external works and pavement design will be interrogated. Investigation of emerging technologies will develop research skills and use of Information Technology.

There are 4 Learning Outcomes which are assessed by a coursework submission and a closed book examination. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Work place evidence may include design loading information, structural grid and layout drawings, specification and selection of

materials and components, pavement design including drawings and specification, health and safety construction phase plan etc.

UH208429 Structural Analysis and Design

20 Credits

This module aims to provide students with knowledge and understanding of structural mechanics to enable learners to solve problems related to a variety of Civil Engineering Structures. Consideration of principles which influence structural design and an ability to undertake structural design. Engineering communication skills are integrated into the learning and assessment processes of this module.

There are 4 Learning Outcomes which are assessed by an open book assignment and a closed book examination. Examples of work place evidence may include design and loading calculations and analysis.

UH208427 Hydrological Engineering

20 Credits

This module aims to provide students with an appreciation of the principles of surface water drainage, sustainable urban drainage, sustainable flood management and open channel flow. The module will evaluate options for surface water control and consider the design of drainage options.

There are 4 Learning Outcomes which are assessed by a coursework submission and an open book examination. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Work place evidence may include calculations of predicted flow rates, detailed design drawings and specification for sustainable urban drainage and/or sustainable urban drainage, applications and regulatory documentation etc.

UH208424 Civil Engineering Project 2

20 Credits

This module will be delivered as the summative project end to Level 8 studies and allow the learner to develop self-reliance to commit to the module aims and deadlines. The emphasis for this project is on joining up all the components of the elements taught in Level 7 & 8 of the programme and enhance skills, outputs and attributes gained through study and work experience. The project will be based on a case study or live project.

There are 3 Learning Outcomes which are assessed by coursework submissions. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Examples of work place evidence may include project planning records, health and safety and site set up records and forms, drawings and specifications, quality control monitoring including non-conformance.

UH209760 Civil Engineering Measurement and Contract Law **20 Credits**

This module aims to develop an applied knowledge of the main principles of managing, planning, programming and administering complex and technically demanding areas of Civil Engineering projects. Learners will have opportunity to develop through critical analysis with tutorial questions project management principles, theories, strategies and principals. Discussion themes will develop appreciation of procurement strategies, forms and practice and in addition learners will carry out civil engineering measurement. These skills will develop an appreciation of the roles and responsibilities of key personnel within project teams.

There are 4 Learning Outcomes which are assessed by coursework submissions. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Work place evidence may include 'take off' measurements, drawings, sketches and calculations, bill of quantities, forms of contract and other commercial documentation.

UH209759 Applied Structural Analysis and Design **20 Credits**

This module aim is to develop structural engineering application of analysis and design concepts providing learners with the knowledge required to carry out the design of structural elements. European and/or National Standards will be used in structural design. Consideration will also be given to the design of temporary works required during construction.

There are 4 Learning Outcomes which are assessed by an open book assignment and a closed book examination. Examples of work place evidence may include full steel, concrete or timber detailed design calculations, software analysis, design drawings and specifications.

UH209763 Environmental Legislation and Sustainability **20 Credits**

This module aims to develop an understanding of environmental issues and current legislation in the construction industry. The module will develop an appreciation of issues and mitigation measures adopted in key areas such as contaminated land, water quality and general construction activities. Sustainable materials and techniques will be researched and evaluated in the case study project.

There are 4 Learning Outcomes which are by open book examination and coursework. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Work place evidence may include survey information, specialist environmental applications and consents, CAR applications and licences and environmental scoping documentation.

UH209764 Geotechnical Engineering 3

20 Credits

This module aims to provide students with an understanding of the impact of ground conditions on the competent design and construction of projects. It will include work on the flow of water, consolidation, slope stability and the potential of contaminants in the soil. Engineering communication skills and the use of Information Technology solutions are integrated into the learning and assessment processes of this module.

There are 3 Learning Outcomes which are assessed by coursework and open book examination. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Work place evidence may include foundation design information.

UH209761 Civil Engineering Project 3

20 Credits

This module aims to provide learners with the opportunity to apply skills gained during the course to apply to a Case Study. The learners will work in groups to prepare conceptual designs and plans for a Civil Engineering project, justifying all solutions and presenting their solutions to peers. The project will develop research, analysis and presentation skills. This module will explain how a project is developed through concept; design through to construction with consideration of regulatory requirements and restrictions. Critical evaluation will develop professionalism and employability skills.

There are 3 Learning Outcomes which are assessed by coursework. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Examples of work place evidence may include any design, planning, H&S, environmental, commercial or quality records as applied in the project.

UH209765 Site Surveying and Communication 2

20 Credits

This module aims to provide students with knowledge and understanding and practical experience of advanced terrestrial surveying, setting out and 3D computer aided drawing practices including digital terrain modelling in the construction industry. This will help students to understand the theory behind more advanced surveying practices and the errors that can occur. The student 's understanding of the theory, purpose, calculations required, instruments and sources of errors in typical terrestrial and hydrographical surveys and setting out work related to construction will be further developed, and communication by means of 3D technical drawings enhanced.

There are 4 Learning Outcomes which are assessed by coursework. Coursework submission may include work based evidence where relevant to satisfy learning outcomes.

Examples of work based evidence may include drawings (created, modified and completed by the student and approved by employer), notes, level book, calculations and photos of surveying and setting out, quality assurance forms, drawing registers, instrument check sheets etc.

UH209762 Civil Engineering Technology 3

20 Credits

This module aims to provide students with an understanding of Civil Engineering Technology in areas of groundworks, transport, highway engineering and surface drainage design. This module will consider highway engineering and construction planning. Investigation of emerging technologies will develop research skills and use of Information Technology.

There are 4 Learning Outcomes which are assessed by coursework submissions. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Examples of work place evidence may include drawings and specifications for highway design, analysis of site investigation, calculations and materials selection data.

TBC Planning & Project Management

20 Credits

This module aim is to enable students to experience engineering problem solving, team work, project execution and management establishing the fundamental principles and techniques of Project Management. The module will critically assess the processes and strategies undertaken by project managers to define, plan control and deliver project requirements. Engineering communication skills and project management will be developed in this module.

There are 3 Learning Outcomes which are assessed by coursework submission and open book exam. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Work place evidence may include any commercial, project planning and application forms, programming and progress documentation and any records of project supervision and management.

TBC Integrated Civil Eng. Design

20 Credits

This module aim is to enable students to experience engineering problem solving, design, team work, project execution and management. To satisfy program requirements, the projects must have certain components such as problem definition, research, scheduling, solution analysis, design and communication of results. Consideration will also be given to

the design of temporary works required during construction. Engineering communication skills, assessment and design will be developed in this module.

There are 3 Learning Outcomes which are assessed by coursework submission and open book exam. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Coursework submission may include work based evidence where relevant to satisfy learning outcomes. Work place evidence may include any relevant design information.

TBC Work Based Project and Portfolio 40 Credits

This module is designed to prepare the students for professional membership of any of the relevant industrial professional bodies e.g. Institution of Civil Engineers. The project report will be based on one (maximum of three projects) the student has had key responsibilities for and will detail the students' roles and responsibilities demonstrating their experience and professionalism. The work place evidence will be reflected on in relation to the high level learning out comes of the Graduate Apprenticeship framework (<https://www.skillsdevelopmentscotland.co.uk/media/43672/civil-framework-level-10.pdf>)

UH210216 Dissertation (Civil Engineering) 40 Credits

This module will be delivered in the final year and will provide the students with the opportunity to undertake an individual in-depth study of a theory or practical research area in Civil Engineering. For the individual project an outline of emerging or developing ideas or issues within the engineering, construction or building industry will be provided to enable the students to select a topic and develop characteristics of a good researcher. This will develop skills of evaluation, analysis, synthesis and problem solving.

2. Programme organisation and management

2.1. Delivery

This course is delivered over four years whilst you are in full time employment as a trainee Civil Engineer or Civil Engineer Technician. You will attend UHI on a block release basis with varying blocks no longer than three weeks at a time, out with block delivery learning will be supported by the VLE. You will be appointed a personal academic tutor (PAT) to support their academic progression. This is a work based learning degree where work place learning will occur whilst you carry out normal work activities. To support learning in the work place you will be allocated time to reflect on work activities supported by the VLE and a work place mentor. The work place mentor will help identify key learning and training opportunities in the work place and ensure you are exposed to a variety of work experience and projects to develop a range of work place evidence. Work place evidence will be used to inform delivery as well as in assessment of the learning outcomes.

Whilst attending UHI on block release you will be required to attend five days a week, each day begins at **9am** and ends at **5-6pm**. The timetable will show formal class times only. The timetable will detail classes which will vary from 2 hour to 4 hour sessions. However, you might be expected to attend college out with these times if necessary, and should always be available if this is required. There is access to an AutoCAD suit for self-directed study from 5pm – 9pm Monday to Thursday, 5pm to 7pm on a Friday and 9am to 1pm on a Saturday throughout term time for students to access resource.

Learning in the work place will occur from carrying out the roles and responsibility of a trainee Civil Engineer or Civil Engineering Technician. The VLE will provide core theory and activities for students to refer to at all times. You will be allocated time to reflect on learning and carry out VLE activities whilst in the work place (between blocks). There will be an appointed work place mentor who will support you in identifying key learning points and linking work practice to VLE theory. The mentor will identify areas of training and experience you should be exposed to.

2.2. Work Based Learning and University Virtual Learning Environment (VLE)

The university encourages the use of blended learning and defines blended learning as ‘a considered approach that selects from a range of traditional face-to-face methods and e-learning technologies to facilitate student engagement, develop independent learners and enhance the learning experience.’

This simply means that some, or all, modules will use a variety of different resources and mechanisms to deliver the content. This could involve traditional classroom activities, the use of interactive software and accessing course materials in the virtual learning environment. This is a collection of integrated online tools. Access is usually restricted to university staff and students.

Flipped classroom is another approach adopted in delivery where students will be required to carry out reading, engaging with videos and information on the VLE and completing activities on the VLE as preparation for face to face sessions where these session can be interactive problem solving workshops based on individual or group tasks and case studies. Students will be asked to provide work place evidence to form activities to provide contextualisation to learning.

Each unit lecturer will explain exactly how that unit will be delivered, what materials are available and how they should be used for that subject.

2.3. College calendar

You will be provided with a copy of the college calendar with all block and exam diet dates.

2.4. Attendance

You are expected to attend all classes as scheduled on your timetable. If you are unable to attend for any reason you must contact your Personal Academic Tutor (PAT). Attendance information will be shared with the employer.

2.5. Community of Learners

Delivery is scheduled and planned for groups to be mixed together and work across groups on various projects. Learning is a social experience and the beginning of your professional network so we encourage you to form social groups and support each other.

There are workshops and drop in support sessions where you will share the space and tutor support with other groups of Civil Engineering and Built Environment students to benefit from peer review and support.

Engage with site visits, ICE meetings and activities to meet other students and build you student community.

2.6. Feedback from students

Information on your attendance and progression will be shared between the UHI and your employer. You will be encouraged to provide feedback on delivery and structure of the programme as well as on their experience and learning in the work place. The PAT will ensure information on assessment results are provided and the student receive all assessment feedback. The work place mentor will be encouraged to provide feedback on the link between work practice, learning materials and programme structure.

2.7. Course committees

Course committees are the main forum for improving the learning and teaching environment on each course. Two course committee meetings will be held each year, one per semester. The student representative is the main voice of all the students in their class and play a key role at course committee meetings.

2.8. Personal Academic Tutor (PAT)

You will be allocated a PAT who will be the first point of contact for any academic or support matters. They have an overview of attendance, progress and attainment of assessments and the students final award. You will meet with their PAT three times each academic year to discuss progress and plan future developments. The PAT may contact you if there are any concerns about attendance or progress on the course. If you or your work place mentor have any queries about the course, or personal or support matters which are affecting the students studies, or work place issues impacting on progression they should contact the PAT as soon as possible. The PAT will discuss your concerns, and if necessary refer you on to the appropriate person, or specialist guidance.

The PAT will input into the Individual Learning Plan (ILP) during the three annual reviews as well as the student and work place mentor.

2.9. Role of the Work Place Mentor (Mentor)

The work place mentor will be identified by the employer and they will support your learning in the work place. Work place learning will occur in two main ways, learning by carrying out normal duties fulfilling the roles and responsibilities of a trainee Civil Engineer or Civil Engineering Technician and learning by reflecting on work practice linking to key theory and information available in the work place and supported by the VLE. The work place mentor will meet with you and support your learning by ensuring you are exposed to a variety of roles and responsibilities increasing with experience and progression and assisting them with linking work experience to learning outcome of the Graduate Apprenticeship.

It may be advantageous where there is an appointed Delegate or Supervising Engineer (ICE) as part of an ICE training scheme that they also act as the work place mentor. The key roles of the work place mentor include:

- consider whether a candidate has a reasonable chance of achieving the chosen programme during the selection process
- create an environment of reflective learning, and giving the trainee feedback
- provide support and encouragement to the graduate apprentice
- provide agreed information to support the candidate's application to the degree course
- provide apprentices with suitable opportunities to gain the type of experience in the workplace that will support their learning and skills acquisition
- continually challenge the graduate apprentice to achieve more
- make graduate apprentices feel secure in tackling demanding new roles
- liaise with the learning provider on the content and practical activities in the apprentice's individual learning and training plan
- provide information that will support the individual apprentice and their assessment
- identify opportunities which are mutually beneficial and rewarding to the graduate apprentice, employer and UHI e.g. scholarships and training
- make sure the graduate apprentices existing skills are used in a cost-effective way i.e. ensure they are exposed to experience to learn but also carry out required work

For example the you may carry out testing and work associated with a concrete pour, whilst carrying out these keys tasks you are learning core content of the module construction materials but also carrying out your key work responsibilities. In your reflection time the work place mentor should support you in linking these activities to the theory on the VLE and identifying the learning outcomes. The mentor should also challenge you by asking you questions and directing further learning opportunities when you are next carrying out these tasks but also benefiting the employer by providing a well-rounded knowledgeable employee.

The mentor will input into the Individual Learning Plan (ILP) during the three annual reviews as well as the student and PAT.