

**Programme Specification**

**Title of Course: BSc (Hons) Construction Engineering Management**

**Degree Apprenticeship**

**Date Specification Produced: July 2018**

**Date Specification Last Revised:**

This Programme Specification is designed for prospective apprentices, current apprentices, academic staff and potential employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical apprentice might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the teaching, learning and assessment methods, learning outcomes and content of each module can be found in the Course Handbook and Module Descriptors.

*Examples of completed programme specifications can be found on the:*

[*KU Programme Specification Archive*](http://www.kingston.ac.uk/programme-specifications/)**SECTION 1: GENERAL INFORMATION**

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| **Title:** | BSc (Hons) Construction Engineering Management |
| **Awarding Institution:** | Kingston University |
| **Teaching Institution:** | Kingston University |
| **Location:** | Kingston University  |
| **Programme Accredited by:** | To be confirmed |

**SECTION2: THE PROGRAMME**

1. **Programme Introduction**

As defined in “English Apprenticeship: Our Vision 2020”, published in 2015, an apprenticeship is a job with a formal programme of training. This Degree Apprenticeship (DA) programme is designed to provide the underpinning knowledge (K) identified by the expected apprenticeship standard (Construction Site Management Standard - to be approved). For apprentices who wish to study Construction Management to Honours Degree level (L6) through this five-year DA programme and aspire to achieve the professional status of Chartered Construction Manager, their learning journey is set out so that they would gain the technical and theoretical knowledge up to the required level (L6). The programme’s content was also reviewed against the relevant DA standards ensuring that it delivers on set skills (S) and professional behaviours (B). This is captured by the mapping of the programme’s modules to the sets of Core/optional knowledge and skills as well as the set of professional behaviours (refer to the mapping document). The academic delivery on this BSc (Hons) qualification is offered through a 1-day a week release which will predominantly account for the required 20% off-the-job training

It is also designed so that the academic team working in partnership with the employer ensure that, in addition to the relevant practical experience gained through the job itself, a specific on-the-job training takes place to develop the technical and professional skills and behaviours much more fully and in line with standards. This is captured by the Stakeholder Commitments Matrix (refer to appendix B in the Academic Liaison & Staff Development document).

The Module mix and course equips graduates with the knowledge, comprehension, and intellectual ability and subject practical skills to become professional chartered construction managers, engineers or to follow careers in related professional areas. Professional skills and behaviours are key elements of the course and hence the emphasis on management, communication, interpersonal and technical skills that enhance professional attributes.

The course aims to cultivate technical and managerial proficiency in Construction Management including the ability to tackle a wide variety of practical problems. The course emphasises the development of a professional attitude to management, design, maintenance, sustainability, quality and safety. This BSc (Hons) course has retained the development of practical skills and experimentation through the use of laboratories, site visits and field courses. ‘Sustainability’ and ‘Health and Safety’ are threaded through the course modules.

This BSc (Hons) Construction Engineering Management Degree Apprenticeship is offered as a 1-day a week five-year degree apprenticeship programme for those taking up construction management related apprenticeship employment with their employers. 30 credits at level 6 will be delivered via a work-based learning module. The remaining 330 credits will be taught via an intense 1-day a week education programme at Kingston University for each of the five years of the programme (See Section E for the programme structure). The degree apprenticeship course has been designed for those wishing to undertake a challenging programme of study which will enable them to study in depth many aspects of construction management with a view to develop/advance their career in construction within the private practice, the corporate sector or public sector.

A distinctive feature of the field/course is the integrated curriculum provided at Level 4. The Level 4 modules on this field/course are designed to share learning outcomes with Level 4 modules on other construction, surveying and engineering related fields/courses whilst also maintaining certain discrete Construction Management related learning outcomes. This aims to develop in apprentices a solid understanding of other construction, surveying and engineering related disciplines and aid in developing a culture of interdisciplinary and collaborative working which are at the top of the construction industry’s agenda.

Throughout the course apprentices will have the support of a personal tutor who can provide one-to-one guidance and advice on academic matters. The personal tutor will be an academic staff member allocated to each apprentice on their first day at the university. The apprentices are also supported by an employer mentor, a professional construction manager, at the work place who will monitor the progress of the apprentices’ continuing learning at work, especially in achieving the learning outcomes of the work-based module. Reports on the apprentices’ progress by the employer mentor will be conducted through an agreed reporting mechanism and by means of scheduled visits to the work place where progress review meetings would take place. The personal tutor and the employer mentor will meet at least once every teaching block to ensure that the apprentices are progressing as planned and their learning experience at the university and at the work place is also acquiring the broader competencies such as: communication, group working, time and project management, computer literacy and problem solving skills.

Apprentices will be taught by both expert academics and qualified practitioners who continuously feedback the outputs of their research and latest developments into their teaching. Academic staff are also involved with the professional bodies, some as assessors, and provide support for apprentices towards their preparation for entry into the professional bodies (End Point Assessment). The professional development of apprentices on this programme will be continuously recorded and monitored, especially in the last 2 academic years of the degree, where this becomes an integral part of the progress review(s) to meet the mandatory requirements of professional bodies.

1. **Aims of the Programme**

The general aim of the course is:

* To equip graduates with the management, surveying, engineering, design, business and personal skills required to become Chartered Construction Managers and/or Incorporated Engineers and enable graduates to follow careers in related professional disciplines where clear, logical, numerate, management and team working skills are required;

More specific aims of the course are:

* To produce graduates with a breadth and depth of knowledge and a comprehension of the key aspects of Construction Management, Surveying and Engineering;
* To allow graduates to communicate effectively orally and in writing and to use relevant methods and forms to convey engineering, surveying and construction ideas and concepts;
* To develop graduates with an aptitude for applying technology and management principles to engineering and construction problems;
* To prepare graduates with an ability to solve management and design problems and the technical skills needed to realise these solutions;
* To furnish graduates with a firm grasp of ‘Sustainability’ and ‘Health and Safety’ principles within the context of their discipline;
* To equip graduates with the research skills required for postgraduate study and employability skills required for work in the construction and related industries;
* To provide apprentices in relevant employment an opportunity to study a degree in Construction Management on an apprenticeship day-release basis;
1. **Programme Learning Outcomes**

The programme provides opportunities for apprentices to develop and demonstrate knowledge and understanding, intellectual skills and subject practical skills as outlined in the following table. The programme outcomes are referenced to the Institute for Apprenticeships Chartered Construction Site Management (Degree) Standard (ST0047), the QAA subject benchmarks for Land, Construction, Real Estate and Surveying (2016) and the Framework for Higher Education Qualifications in England, Wales and Northern Ireland (2008).

Alongside studying technical and professional subjects, apprentices will have their entry level communication skills developed further though all different levels of the degree apprenticeship programme. Teaching staff will demonstrate a full range of communication skills for the apprentices to emulate. Apprentices will be given opportunities during interactive in-class sessions to practice these skills. Within this context, communication skills will encompass professional report/essay writing, oral presentations supported by visual means, time management and appropriate academic referencing.

Assessment and coursework marking schemes in particular, will reward the quality, clarity, cogency, structure, professional presentation standards and overall effectiveness of the communication. Feedforward will provide apprentices with direction and guidance utilising good practice examples for apprentices to follow. Feedback will clearly point out areas where apprentices need to achieve further improvements in relation to their communication skills development.

Written assessments will typically evolve from a few hundred words at Level 4 to a few thousand at Level 6. The rationale for this is so that apprentices are set assessments appropriate to the development of their communication skills. These will enable apprentices to progressively practice, demonstrate and enhance their communication skills through more advanced applications and be supported in this process through the steps outlined above. Oral presentations will typically be 10 minutes followed by a questions and answers session to match the requirements of the professional bodies.

Apprentices will be directed towards the SEC Academic Success Centre (SASC), where apprentices can obtain help on a range of academic skills from writing reports, note-taking, exam revision, referencing, programming and mathematical skills. SASC provides assistance and advice on draft assignments prior to hand-in to the teaching staff. Personal tutors will also utilise one-to-one tutorial sessions to maintain oversight of the apprentices’ communication skills development, provide time for reflection and self-assessment and support apprentices to develop an improvement plan.

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| **Programme Learning Outcomes** |
|  | **Knowledge and Understanding****On completion of the course, apprentices will be able to:** |  | **Intellectual skills** **On completion of the course, apprentices will be able to:** |  | **Subject Practical skills** **On completion of the course, apprentices will be able to:** |
| A1 | Demonstrate knowledge and understanding of materials, structures and geotechnics recognising various professional roles and the parties involved in all stages of the construction/civil engineering project as well as the interdisciplinary relationships between the functions of construction and the other disciplines of the built environment.  | B1 | Apply fundamental theoretical principles that underpin construction management and other disciplines of the built environment, particularly civil engineering. | C1 | Use safely laboratory and workshop equipment for experimental investigation and evaluate data to produce practically valuable results |
| A2 | Demonstrate knowledge and understanding of surveying, traffic and site practice and health and safety, as well as various construction technologies recognising the appropriate software that supports construction and digital construction.  | B2 | Use mathematics as a tool for solving construction problems, communicating results, concepts and ideas  | C2 | Undertake fieldwork and analyse the data obtained for use in planning and design  |
| A3 | Demonstrate knowledge and understanding of the management of construction identifying the key concepts and principles used in construction management including business, legal, cultural and ethical and recognising the regulatory systems including building and planning regulations.  | B3 | Think creatively and imaginatively to solve management and design problems. | C3 | Utilise management techniques to control design and construction  |
| A4 | Demonstrate an appreciation of principles and processes that deliver an inclusive environment recognising the diversity of user needs including communities and the stakeholders, and the importance of professional ethics. | B4 | Manage projects, people, resources and time taking account of sustainability, legal and statutory requirements, risk, safety, quality and reliability | C4 | Use digital technologies to support interdisciplinary collaborative working in the construction management process. |
| A5 | Demonstrate understanding of mathematics necessary to support application of key theories and principles used in the management of construction, engineering and the other disciplines of the built environment.  | B5 | Demonstrate a positive attitude to learning that encourages continuing professional development throughout their careers | C5 | Prepare construction and engineering documentation including producing estimates, cost planning and compiling pricing and tender documents.  |
| A6 | Relate all their studies to a knowledge and holistic understanding of sustainability including social, economic and environmental aspects within the context of the built environment. | B6 | Recognise the importance of professional bodies and the professional conduct expected of Construction Managers and Professional Engineers | C6 | Apply procedures relevant to standard contracts and statutory controls |
| DK2 | Critically evaluate information and use it appropriately | EK2 | Present and record data in appropriate formats | FK2 | Identify resources needed to undertake the task or project and schedule and manage the resources |
| DK3 | Apply the ethical and legal requirements in the access and use of information | EK3 | Interpret and evaluate data to inform and justify arguments | FK3 | Show the ability to successfully complete and evaluate a task or project, revising the plan where necessary |
| DK4 | Accurately cite and reference information sources using the recommended standard method | EK4 | Be aware of issues of selection, accuracy and uncertainty in the collection and analysis of data | FK4 | Motivate and direct others to enable an effective contribution from all participants |
| DK5 | Use software and ICT as appropriate |  |  | FK5 | Use skills to manage projects and scenarios |
|  |  |  |  | FK6 | Respond to society’s concerns about the impacts of construction and engineering upon the environment |

In addition to the programme learning outcomes identified overleaf, the programme of study defined in this programme specification will allow

Apprentices to develop a range of Key Skills as follows:

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| **Key Skills** |
| **Self-awareness Skills** | **Communication Skills** | **Interpersonal Skills** | **Research and Information Literacy Skills** | **Numeracy Skills** | **Management & Leadership Skills** | **Creativity and Problem Solving Skills** |
| Take responsibility for own learning and plan for and record own personal development | Express ideas clearly and unambiguously in writing and the spoken work | Work well with others in a group or team | Search for and select relevant sources of information | Collect data from primary and secondary sources and use appropriate methods to manipulate and analyse this data | Determine the scope of a task (or project) | Apply scientific and other knowledge to analyse and evaluate information and data and to find solutions to problems |
| Recognise own academic strengths and weaknesses, reflect on performance and progress and respond to feedback | Present, challenge and defend ideas and results effectively orally and in writing | Work flexibly and respond to change | Critically evaluate information and use it appropriately | Present and record data in appropriate formats | Identify resources needed to undertake the task (or project) and to schedule and manage the resources | Work with complex ideas and justify judgements made through effective use of evidence |
| Organise self effectively, agreeing and setting realistic targets, accessing support where appropriate and managing time to achieve targets | Actively listen and respond appropriately to ideas of others | Discuss and debate with others and make concession to reach agreement | Apply the ethical and legal requirements in both the access and use of information | Interpret and evaluate data to inform and justify arguments | Evidence ability to successfully complete and evaluate a task (or project), revising the plan where necessary |  |
| Work effectively with limited supervision in unfamiliar contexts |  | Give, accept and respond to constructive feedback | Accurately cite and reference information sources | Be aware of issues of selection, accuracy and uncertainty in the collection and analysis of data | Motivate and direct others to enable an effective contribution from all participants |  |
|  |  | Show sensitivity and respect for diverse values and beliefs | Use software and IT technology as appropriate |  |  |  |

1. **Entry Requirements**

The minimum entry qualifications for the programme are:

From A levels: Three A2 levels at Grade C or higher or their equivalent but the final decision is that of each employer

Technician

Apprenticeship: Level 3 apprenticeship in a construction or property related discipline

Plus: GCSE (A\*-C on the previous GCSE grading system or 9-4 on the new GCSE grading system) minimum of 5 subjects including English language and Mathematics

Following receipt of the potential apprentice’s application, the University will review the candidate’s application against the published entry requirements to ensure these have been met. Accordingly, the University will advise the Employer if a place on the programme can be offered.

1. **Field/Course Structure**

This programme is offered in an apprenticeship day release mode, with weekly one-day release from employment for scheduled learning at the University and continuing learning at the work place and leads to the award of BSc Construction Management. The course is completed when apprentices have successfully achieved 330 credits at the university and 30 credits in the work-based module at Level 6.

Advanced entry to Level 5 requires the completion of the Level 4 Construction Technician Standard; HNC in Construction; ACIOB status or equivalent qualifications and commensurate experience.

Intake is normally in September.

**E1. Professional and Statutory Regulatory Bodies**

**E2. Work-based learning**

This BSc programme is designed for those employed within the construction related industry. There is one work-based module in the programme at Level 6, namely CE6314. This work-based module provides apprentice opportunities to acquire and apply knowledge in the work place while developing professionally.

Apprentices set out to achieve the learning outcomes of the work-based module by writing the Learning Plan. The learning plan must include an initial assessment of the learning outcomes and the level of competency learners have already achieved, and list the evidence required through planned activities at work to demonstrate that the learning outcomes of the work based element have been achieved. Through the learning plan, apprentices will match the knowledge acquisition in the work place to the learning outcomes for the work-based module.

The assessment of the work-based learning is stated in the module descriptor. It comprises:

• Two assignments designed to assess the demonstration of knowledge and understanding and their application and

• An oral presentation at the university.

The benefits of this work-based module are two-fold:

• Apprentices having the opportunity to acquire knowledge and apply that knowledge in complex work place situations,

• Enhancing the University’s engagement with industry.

**E3. Outline Programme Structure**

Please refer to the Course Diagram in the Appendix at the end of this document. Each level is made up of four modules each worth 30 credit points. Typically an apprentice must complete 120 credits at each level. All apprentices will be provided with the University regulations and specific additions that are sometimes required for accreditation by outside bodies (e.g. professional or statutory bodies that confer professional accreditation). Full details of each module will be provided in module descriptors and apprentice module guides.

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| **Level 4** (all core) |
| **Compulsory modules** | **Module code** | **Credit** **Value** | **Level**  | **Teaching Block** |
| Engineering Design and Professional Practice | EG4010 | 30 | 4 | 1&2 |
| Structures, Materials and Construction Methods | EG4020 | 30 | 4 | 1&2 |
| Applied Mathematics and Computing Applications | EG4030 | 30 | 4 | 1&2 |
| Construction Management and Site Investigation | EG4040 | 30 | 4 | 1&2 |

To progress from Level 4 to Level 5, an apprentice should normally have achieved not less than 120 credits at Level 4. However, a PAB may permit an apprentice to progress to Level 5 with 90 credits at Level 4.

Apprentices exiting the field/course at this point who have successfully completed 120 credits are eligible for the award of Certificate of Higher Education in Construction Management.

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| **Level 5** (all core) |
| **Compulsory modules** | **Module code** | **Credit** **Value** | **Level**  | **Teaching Block** |
| Engineering Project Management | EG5014 | 30 | 5 | 1 & 2 |
| Site & Engineering Surveying | CE5112 | 30 | 5 | 1 & 2 |
| Construction Business and Law | CE5211 | 30 | 5 | 1 & 2 |
| Materials, Design and Procedures | CE5213 | 30 | 5 | 1 & 2 |

Progression to Level 6 requires an apprentice to have achieved not less than 120 credits at Level 5.

Apprentices exiting the programme at this point who have successfully completed 120 credits at Level 4 and 120 credits at Level 5 are eligible for the award of Diploma of Higher Education in Construction Management.

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| **Level 6** (all core) |
| **Compulsory modules** | **Module code** | **Credit** **Value** | **Level**  | **Teaching Block** |
| Building and Environmental Engineering | CE6113 | 30 | 5 | 1 & 2 |
| Site Practice and Management | CE6211 | 30 | 5 | 1 & 2 |
| Contractual Procedures | CE6212 | 30 | 5 | 1 & 2 |
| Individual Project and Research Methods  | CE6314\* | 30 | 5 | 1 & 2 |

\* Work-based module

Level 6 requires the completion of all the modules above.

1. **Principles of Teaching, Learning and Assessment**

The BSc Construction Engineering Management Course has been designed, taking into account the Kingston University Curriculum Design Principles to help develop apprentices into graduates that are professional, thoughtful, creative, resilient, proactive and globally aware independent, equipping them to be lifelong learners.

The programme provides opportunities for apprentices to develop and demonstrate knowledge and understanding specific to the subject, key skills and graduate attributes in the following areas. The programme outcomes are referenced the expected apprenticeship standard (Construction Site Management Standard - to be approved), the QAA subject benchmarks for Land, Construction, Real Estate and Surveying (2016) and the Framework for Higher Education Qualifications in England, Wales and Northern Ireland (2008).

Alongside studying technical and professional subjects, apprentices will have their entry level communication skills developed further though all different levels of the degree apprenticeship programme. Teaching staff will demonstrate a full range of communication skills for the apprentices to emulate. Apprentices will be given opportunities during interactive in-class sessions to practice these skills. Within this context, communication skills will encompass professional report/essay writing, oral presentations supported by visual means, time management and appropriate academic referencing.

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**Overarching principles**

All apprentices on the programme are working towards a professional career in which they must be able to exercise judgement, communicate with clients and the public and throughout take an ethical approach to all that they do; we also encourage them through the design and execution of the curriculum to be both knowledgeable in terms of how sustainability principles apply to their own field but also develop a responsible attitude towards the role that built environment professionals can play in helping to manage resources in ways which promote environmental sustainability, good governance, respect for people, well-being and the pursuit of economic goals. Sustainability is woven into the fabric of each module and underpins the teaching and learning approaches used in order to achieve deep and holistic learning of sustainability concepts, principles and values.

The role of teaching and assessment is to underpin apprentice learning and throughout the programme, the strategy is to engage apprentices with a wide range of activities that enable them to develop the knowledge and skills that they will need as practitioners alongside their knowledge base. The apprentice should, as far as practicable, be empowered to take control of their learning but be supported strongly through the process. It follows that as the apprentice progresses through the levels the emphasis will shift from teacher-led learning to apprentice-led learning though lectures will continue to feature at all levels of the programme. In delivering on this principle, much of the teaching related to knowledge and understanding will be focused on simulated real life study and projects in which apprentices will be led through the materials and required to develop their skills through the tasks set.

Field trips and site visits are key components of the strategy. Although apprentices will have the work-based element of learning, field trips and site visits with other learners will provide additional benefits. They will provide the apprentices a chance to get up close to the construction and management of a variety of projects in new environments. Furthermore, field trips and site visits will enhance the apprentice’s experience, by helping them develop investigation and teambuilding skills, and reinforcing their social, personal and emotional development.

**Teaching & Learning**

A solid and comprehensive technical and professional knowledge base is non-negotiable and is delivered through lectures and seminars provided in a collaborative working environment which aims to facilitate lecturer/learner and learner-to-learner interaction across disciplines. Lectures are used to impart key information and will normally be followed up by tutorials and workshops which provide opportunities for problem-based learning (PBL), project-based learning (PjBL), flipped classrooms and game learning via a range of in-class activities including for instance scenario analysis, role-play and simulations.

Module guides set out clear expectations for guided independent learning. Apprentices will be directed to reading to prepare for individual topics or sessions and also to problem sets or exercises to consolidate and test their learning. This will be introduced at Level 4. The Virtual Learning Environment (VLE) at Kingston will support learning throughout the course through a variety of Technology Enhanced Learning (TEL) objects such videos, screencasts, on-line MCQs, discussion boards and interactive teaching packages. It will also deliver teaching material such as lecture notes/presentations, problems sets and worked examples. This helps support an inclusive approach as apprentices can access learning material at their convenience and work through it at their own pace with the opportunity to pause and rewind as they wish.

In the case of **EG4020 Structures, Materials and Construction Methods;** and **CE5213 Materials, Design and Procedures** the use of online videos reinforces the apprentices learning and helps them to understand how construction elements are put together. This helps support an inclusive approach as apprentices can access learning material at their convenience and work through it at their own pace with the opportunity to pause and rewind as they wish. Teaching may be augmented by on-line discussion boards to aid understanding. We recognise that an ability to be comfortable with a range of digital media is important to employability skills and effective learning. Apprentices also need to be computer literate and able to operate industry standard computer packages.

Developing skills is also critical to successful vocational education. These skills are practical – such as the ability to design and draw building details and layouts both free hand and with the use of IT programmes such as computer aided design software. Apprentices will also have skills in Excel and will have developing skills in project management software programmes and in Building Information Modelling (BIM); they will also learn to access research databases efficiently. They will develop professional skills, such as how to write and present reports on strategic advice and programmes of building works of maintenance and alteration and intellectual skills, such as resolving problems such as construction contract disputes and to debate some of the ethical and policy issues that they may face in their subsequent professional lives. The learning and assessment philosophy also places emphasis on personal skills development, through extensive use of group-based activities, which develop team-working skills and respect for colleagues and reflective diaries, which are critical dimensions of professional practice.

**Integrated first year and interdisciplinary collaboration**

All construction management, building and quantity surveying undergraduate apprentices at Kingston University take a common set of four (30 credit) modules at Level 4. A distinct feature of the course at Kingston and is extended into the second year when all apprentices take a common level 5 module. In **EG4010 Engineering Design and Professional Practice** apprentices will be introduced to the principles and importance of group work. Project-based learning (PjBL) is employed requiring interdisciplinary teams to design, build and present solutions to small scale engineering challenges; the outputs of these will be part of the summative assessment.

Interdisciplinary group work will be further developed at level 5 in **EG5014 Engineering Project Management** where apprentices are taught about group project management in TB1 and then will spend much of TB2 working on a more complex challenge that will comprise 60% of the module assessment. In this module apprentices are likely to tackle a live, real-world problem supplied by a well-known company or organisation. This will give the apprentices an opportunity to talk about how they have worked with an external company on an engineering/construction problem as part of a team.

**Work-based learning**

There are 30 credits of work-based learning at Level 6. Apprentices are expected to achieve all the learning outcomes through the application of knowledge in projects at the work place under the guidance of the Employer Mentor supplemented by sessions at the University. Academic tutorials are provided regularly where lecturers provide direction and guidance on the design of the apprentices’ projects and the application of research methodology and execution. Apprentices will have access to all materials delivered within the equivalent University-based module, which are uploaded to the University’s virtual learning environment.

**Focus on active learning and enhancing apprentice engagement**

A feature of the learning, teaching and assessment strategy in the School of Engineering is that many instructional lectures have been replaced by collaborative, problem solving or enquiry-based learning workshops and tutorials. These require apprentices to prepare for, and participate in, the classroom activities, rather than passively listening to the lecturer. Apprentices are expected to engage with the guided learning to prepare for these teaching sessions and consolidate their learning after the session. These interactive sessions also provide apprentices with opportunities for peer learning, group work and presentation practice. Give some module examples where this occurs In these sessions the lecturer facilitates learning by supporting apprentices in creating their own knowledge and understanding. Lecturers may also introduce and summarise key concepts with short mini-lectures. Project based Learning (PBjL) is introduced in **EG4010 Engineering Design and Professional Practice** and developed further in **EG5014 Engineering Project Management** and **CE6211 Site Practice and Management**. These collaborative activities encourage apprentices to draw on their own set of experiences and cultural backgrounds when tackling real world challenges. The flipped classroom approach is introduced at Level 4, where the curriculum (lecture content) of a small topic is delivered via on-line materials (screencasts, videos or study packs) and then developed and applied in workshops. At level 5 modules have a more substantial flipped classroom approach.

Active and collaborative learning is also incorporated in lectures which may have question-and-answer sessions, brief apprentice discussions, clicker activities integrated into the lecture. These methods ensure that valuable contact time is focussed on the application and critical analysis of knowledge and the development of key skills such as problem solving, communication, and group-work.

The high percentage use of active learning sessions in the teaching hours is aimed at improving apprentice engagement, creativity, confidence and self-reliance. The course endeavours to further secure apprentice engagement by making apprentices feel part of a community and increasing their sense of belonging which supports to improved retention and progression. This is achieved by providing opportunities to interact with staff and apprentices both socially and academically. In addition, to the active learning sessions and group work, this is achieved through: the PT scheme, field work, industrial visits, extra-curricular seminars, research internships, course representative system, apprentice ambassador work, peer mentoring, civic engagement and outreach opportunities.

**Practice and research-informed teaching**

Embedded in our teaching and learning practice are two major shifts in pedagogy, specifically, our teaching is both practice and research informed. In addition to academic staff, the teaching of specialist topics is delivered by experienced practitioners including recent graduates. The involvement of practitioners in our teaching delivers a range of benefits to the apprentice experience. Practitioners are able to share their professional experience and bring a wealth of knowledge in relation to current and emerging issues within the respective discipline and industry-led practice. Practitioners also serve as inspiring role models for apprentices preparing to enter practice.

Our approach to research-informed teaching is largely based on the concept of research-based teaching where emphasis is on research methodologies, processes and problems, learning in a research or inquiry-learning environment. This is in particular strongly presented in **EG4040 Construction Management and Site Investigation**, **CE5213 Materials Design and Procedures** and **CE6211 Site Practice and Management** where apprentices are active learners, constructing knowledge in a research environment with the guidance of academics as well as construction practitioners from the Industry. With this approach, apprentices learn about research processes or learn in project oriented problems by developing research skills such as ability to critical analyse and reflect, ability to organise and plan, ability to gather & analyse data. **CE6314 Individual Project and Research Methods** also follows this model. This places apprentices at the heart of constructing new knowledge. It seeks to transform apprentices from passive recipients of information to active self-motivated independent learners and researchers who are enabled to challenge existing knowledge bases and partake in the creation and dissemination of new knowledge that furthers and advances scholarship and professional practice within their discipline. There are varied manifestations of research-based teaching in the course taking several forms of experiential learning achieved through in-class problem-based learning, field work and laboratory work. These create opportunities for apprentices to investigate and critique theory and its application and share their reflective findings with other staff and apprentices. Research-informed teaching is also achieved through the concept of research-led teaching where research undertaken by academic staff teaching on the course, which in turn informs the design of learning activities as well as collaborative research projects involving staff and apprentices which often result in publishable research outputs.

**Development of professional employability skills**

The progressive development of a range of key professional employability skills is another feature of the course as exemplified in teamwork/groupwork discussed above. Regarding communication skills, at Level 4, the focus is on writing individual practical reports **EG4020 Structures, Materials and Construction Methods** using a standard format and style, and encouraging apprentices to orally communicate the outcomes of small group exercises in the active learning teaching sessions in **EG4010 Engineering Design and Professional Practice**. At level 5, apprentices will be required to produce a substantial written group report and present their individual findings in **CE5213 Materials Design and Procedures**. To help development of these skills apprentice will be required to submit a draft of a report for EG4010 to the Support for Academic Success Centre for feedback and to discuss this with their personal tutor. At level 6, in the **CE6314 Individual Project and Research Methods** module, apprentices will be taught how to synthesise and critically review information from a variety of sources and report this and their research results in a formal research report and an oral presentation.

To complement the development of employability skills within the curriculum, personal tutors will encourage apprentices to engage in a range of extra-curricular activities such as apprentice representation, sports and recreation, society membership, volunteering ; apprentice ambassadorship, leadership and mentoring; cultural and creative activities; academic and professional collaboration; enterprise activity; KU Talent events and opportunities. Activity in these areas is recognised by the university’s Kingston Award Scheme. KU Talent offers a range of events, including Careers Uncovered fairs, which include employers coming to campus to promote graduate opportunities. On Spotlight on Engineering and Construction networking activities, employers and alumni are invited on campus to talk about career pathways.

**Hands-on Practical work**

Hands-on practical experience in workshops and laboratories is fundamental in developing practical skills as well as enhancing data collection and analysis skills. Apprentices will have the opportunity to work in laboratories in some of their modules. Practical work is closely related to the taught content to provide context for the theoretical work.

At level 4, apprentices are introduced to basic structures and construction engineering materials and how these perform under testing conditions in **EG4020 Structures, Materials and Construction Methods.** At level 5, the focus is on the application of design practice, including the programming as well as identification of construction materials in **CE5213 Materials Design and Procedures**. Additionally, by carrying out site and building inspection and surveys in field work undertaken in **CE5211 Construction Business and Law**. At level 6, apprentices are expected to provide reasoned advice to clients in simulated hearing/expert witness sessions in **CE6212 Contractual Procedures** as well as select and apply requisite practical skills in **CE6314 Individual Project and Research Methods.**

**Assessment for Learning**

The assessment strategy has been designed help apprentices to learn and prepare them for employment, rather than just a tool to measure their learning. The assessments are designed to be authentic, inclusive and transparent. The assessment tasks focus on the real world construction management activities that enhance apprentices’ employability. This is particularly the case for **CE5213 Materials Design and Procedures and CE6211 Site Practice and Management** which both require apprentices to interact with a real life problem or concept. The major group assignment in **CE6211** which acts as a capstone project and encompasses all the skills the apprentices have acquired during their degree programme. Another example at Level 5 is in the module **CE5104 Commercial Construction Technology,** where apprentices are expected to produce innovative client-focused solutions on renewable technologies and the use of sustainable and modern methods of construction to enhance building performance.

All modules have explicit formative assessments to provide opportunities for practice and the chance to use ‘feed forward’ to help apprentices improve their work in subsequent summative assessments. Reports at Level 4 and the feedback given will help the apprentices write their Group Report in **CE5213**. This report in turn will give the apprentices’ feedback which they then can apply to their more comprehensive Group Report in **CE6211**. At Level 6 feedforward client meetings are utilized to provide formative feedback on the development of the apprentice projects progress report in **CE6211 Site Practice and Management.**

Examinations are still used as they are an effective way of assessing basic knowledge and understanding, and professional bodies expect to see examination covering key curriculum content. However, the strategy recognises that other assessment methods are better suited to assessing higher level problem solving skills. It is reflected in the minimise use of examination in Level 5 and 6. The use of a well-balanced range of assessment methods is key part of our inclusive assessment strategy. Group and teamwork assessment is instrumental in developing and recognising this important employability skill.

Assessment is both formative (i.e. the work is marked and feedback given but the mark does not count towards the module achievement mark) and summative (the assessed mark counts towards the module grade awarded). Formative assessment is important as it encourages apprentices and supports their overall learning.

Examples of formative work include:

* Draft submissions of coursework for comment;
* On-line discussion groups monitored by staff;
* In-class quizzes to test recently covered lecture material;
* Formal ‘client meetings’ in which notes are made and feedback given; and
* The preparation of portfolios based on weekly seminar work, where only the final portfolio is assessed summatively.

Summative feedback takes a wide range of forms, some of which have been outlined under the teaching and learning section above and all of which are detailed in the module descriptors. A special feature of the course is the small number of formal examinations which are included. Whilst we hold that examinations do have a role to play in testing knowledge and critical reasoning, there are other methods which have possibly greater applicability to the work that graduates will subsequently undertake. Therefore as far as possible, emphasis is placed on developing simulated and real world experiences. Apprentices undertake academic tasks such as writing reports and essays but a range of academic skills is also tested in more innovative ways in various modules including for instance the simulated projects undertaken in the context of fieldwork and the production of short videos to showcase the apprentices’ work.

As the programme is focused on developing employability skills, the ability to present orally, to produce well-presented and appropriately structured professional reports, and to sketch and produce scheme designs using IT are also assessed. Professionals working in the real estate environment also need to communicate effectively with people from a wide range of backgrounds, all the time demonstrating an ability to sustain an argument, whilst having due consideration for those with whom they are dealing. Therefore oral negotiation, advocacy and debate are all used as assessment methods and the School has developed specific experience in these methods. Each module is designed to test up to six learning outcomes; therefore in each module a range of assessment is undertaken with up to three formal summative points, spread throughout the year better to ensure an even workload for the apprentice. Normally the last assessment task will be synoptic in nature in that it will test all or most learning outcomes, thereby assuring the assessment boards that each apprentice has fulfilled the learning objectives before progressing to the next stage of study. Feedback to apprentices on summative assessment is vitally important. This is delivered through a number of means such as formal written individual feedback which contains pointers for future improvement; class collective feedback; issuing of model answers. The method used will vary depending on the task that was undertaken but staff realise the need for it to be timely and supportive.

**Inclusive Teaching Practice**

Staff-Student Consultative Committees and Boards of Study provide opportunities for apprentices to make suggestions on how to develop a more inclusive curriculum by taking into account the specific circumstances of the apprentice body. The variety of teaching activities also takes account of the apprentices’ different learning preferences and experiences and there is a careful balance of individual and group based activities.

Marking criteria are provided for all assessments as part of the assessment booklet at the beginning of the year for each module and care is taken to ensure that the language used is clear. Assessment and marking criteria for all substantial assessments are discussed in class so all apprentices have an opportunity to interrogate the criteria. One such typical example is the assignment brief issued for the project that apprentices undertake as part of their Level 5 residential field trip to a European destination in CE5211 Construction Business and Law. The brief contains detailed client instructions but apprentices are able to fully interrogate the assessment criteria that relate to project appraisal, site investigation, and proposed project delivery solution once they have been able to visit the selected sites.

In the programme as a whole, the following components are used in the assessment of the various modules:

* Practical exercises: to assess apprentices’ understanding and technical competence.
* Individual and group-based case project work: to assess ability to understand requirements, to provide solutions to realistic problems and to interact and work effectively with others as a contributing member of a team. The outcomes can be:
* Written reports, where the ability to communicate the relevant concepts, methods, results and conclusions effectively will be assessed.
* Oral presentations, where the ability to summarise accurately and communicate clearly the key points from the work in a brief presentation will be assessed.
* Video, which may replicate features of oral presentations but allows advance preparation away from the audience (which may suit some apprentices better).
* Multiple choice or short answer questions: to assess competence in basic techniques and understanding of concepts.
* Long answer structured questions in coursework assignments: to assess ability to apply learned techniques to solve simple to medium problems and which may include a limited investigative component
* Long answer structured questions in end-of-module examinations: to assess overall breadth of knowledge and technical competence to provide concise and accurate solutions within restricted time
* Project: The Individual Project and Research Methods module represents an opportunity for apprentices to draw together different aspects of their learning on the course and to apply the techniques learned in an extended study. As such the assessment here will place a greater emphasis on ability to plan work, manage time effectively, and research background information, culminating in a written report and interview.
* Individual and group practical laboratory reports.

**Employability**

Initially apprentices are guided towards learning about employability skills and career pathways, but as they move through the course they are expected to become more independent and take ownership of their career development by engaging with classes provided by KU Talent, including; professional communication, time management, organisation and other skills. There are also opportunities to perfect skills required to gain employment such as; CV writing, Psychometric Test and Using LinkedIn. An apprentice’s development and career options are discussed in personal tutor meetings and guidance given as appropriate. This is in liaison with the KU Talent team, the University’s Careers Service.

Apprentices receive added value to their learning experience through an informed curriculum and by undertaking field trips, site visits, simulated practice projects and a series of support activities such as employability evenings, CV writing sessions etc. Apprentices are also encouraged to take part in professional body competitions. However, we recognise that employers also value a range of other skills and experiences and apprentices are encouraged to take part in the wider life of the University through sporting, musical or other activities or through community volunteering. In recent years, apprentices within the School have won numerous awards including the National Women in Property Award, the national CIOB Novus Challenge competition and RICS Apprentice Award.

1. **Support for Apprentices and their Learning**

The University recognises that the learning experience is unique to each apprentice. A key part of our approach to an inclusive curriculum is that we acknowledge and where possible accommodate their individual circumstances. The personal tutor scheme is central to the efforts to provide a personalised learning experience (See PT section of programme specification). At level 4 and 5 a core set of problems for each module are issued to apprentices. These cover the whole curriculum for a particular level. Apprentices are required to work through these formative assessment problems as they cover the relevant curriculum. This allows apprentices to test their learning and measure their progress. Discussion of progress on these problem sets will be a key part of the personal tutor scheme. Apprentices are required to upload their progress on these activities onto the learning log created on the University VLE system. The Learning Log will be available to the relevant personal tutors for further discussion during one-to-one meetings. There will be milestones for apprentices to meet at every level, and it will be one of the personal tutor’s roles to monitor the apprentices’ progress and give appropriate advice*.* Where difficulties are encountered PTs will be able to help or direct apprentices to available support including peer mentoring schemes, PAL, Maths aid and on-line resources etc.

Apprentices are supported by:

* **A Module Leader** for each module
* **A Course Leader** to help apprentices understand their programme structure and provide academic support
* **A Personal Tutor** (PT) to foster a close and engaged academic relationship with apprentices and advise and refer apprentices to other University services
* An **Employer Mentor** on the apprenticeship route for work based learning
* There is a **Student Support and Engagement Team** to help apprentices with any problem that is affecting their studies.
* A dedicated **Undergraduate Course Administrator**
* An **induction programme** and study skills sessions at the start of each academic year
* **SEC Academic Success Centre (SASC)** is a one-to-one drop-in Study Skills session for apprentices every weekday. Help is available on a range of academic skills from writing reports, note-taking, to exam revision, referencing, programming and mathematical skills.
* **VLE** – a versatile on-line interactive intranet and learning environment accessible both on-site and remotely
* **Course Representative scheme**
* **KUTalent** a University Careers and Employability Service
* Comprehensive University support systems including the provision of advice on finance, regulations, legal matters, accommodation, international apprentice support, disability and equality support.
* The **Student Union**
* An **Academic Team** that seeks to maintain an open door policy in the spirit of supporting apprentices.

**Personal Tutor Scheme (PTS) in the School of Engineering**

The following provides the aims and structure of the Personal Tutor Scheme (PTS) for the School of Engineering. It is intended that the PTS is embedded within the modular provision of the BSc programme.

**Aims**

* To build a rapport between staff and apprentices and contribute to personalising apprentices’ experience within the School of Engineering
* To support apprentices in the development of their academic skills providing appropriate advice and guidance to apprentices throughout their time at Kingston, while monitoring their progress, helping to identify individual needs and referring apprentices to other University services as appropriate
* To help apprentices to develop the ability to be self-reliant and confident self-reflective learners who use feedback to their best advantage
* To encourage apprentices to reflect on how their learning relates to a wider context and their personal career progression

**Allocation of Personal Tutors**

* Personal tutors will be allocated during induction week
* Tutors will be allocated on a course basis where appropriate with apprentice numbers being equally divided amongst the staff within the school
* Apprentices will keep the same tutor throughout their course of study

**Assessment**

The PTS is embedded in core curriculum modules at each level of undergraduate study:

Level 4 – EG4010 Engineering Design and Professional Practice

Level 5 – EG5014 Engineering Project Management

Level 6 – CE6314 Individual Project and Research Methods

There are specific aims and outcomes for each level, as the PTS is progressive and cumulative, apprentices will find that they are building on the skills developed in previous levels. Formative assessment will be provided in the form of regular feedback during meetings with the Personal Tutor and Employer Mentor when the apprentice will be able to put forward draft assignments for evaluation. The summative assessment will be part of the assignments given in each module.

**Level 4: Settling in and building confidence**

**Aims and Learning Outcomes**

* To assist apprentices in making the transition to Higher Education and to generate a sense of belonging to the School of Engineering with an emphasis on widening participation issues
* To help apprentices to develop good academic habits and to gain the confidence to operate successfully in a university context
* To prepare apprentices to make the most of feedback throughout their course

**Contact:**

* Teaching block 1: three one-to-one meetings during induction week, weeks 2 and 7
* Teaching block 2: two one-to-one meetings during week 1 and week 7
* End of academic year individual ‘wrap up’ email

In addition to a core set of problems for each module apprentices are also given a list of engagement activities that they are encouraged to take advantage of at level 4. PT will discuss progress on problem sets and engagement with certain activities with tutees throughout the year.The Learning Log will be available to the relevant personal tutors for further discussion during one-to-one meetings. There will be milestones for apprentices to meet at every level, and personal tutor’s will monitor the apprentices’ progress and give appropriate advice.

**EG4010 Engineering Design and Professional Practice** is closely linked to the Personal tutor scheme as it introduces key academic and employability skills. In addition it focuses on reflective practice on feedback and their progress with academic and employability skills. It is expected that these are topics of conversation personal tutor meetings.

**Level 5: Stepping it up and broadening horizons**

**Aims and Learning Outcomes**

* To help apprentices comprehend and plan for the academic demands of level 5 and to support increasing independence
* To encourage apprentices to look forward, to take up opportunities to develop wider skills and to take responsibility for their personal development
* To foster apprentices’ ability to build on and respond proactively to the feedback they have received
* To assist apprentices in reflecting on the skills that they are developing and consider how they relate to employability

**Contact:**

* Regular one-to-one meetings from week 1
* Email contact at the end of teaching block 1
* Individual ‘wrap up’ email at end of academic year

Throughout the year, apprentices are expected to reflect on their acquisition of skills with their personal tutors. CV writing and research project planning are activities integrated into **EG5014 Engineering Project Management** and constitute 10% of the module assessment.

**Level 6: Maximising success and moving on**

**Aims and Learning Outcomes**

* To support apprentices with the planning necessary to maximise success in their final undergraduate year
* To encourage apprentices to reflect on the employability skills they have developed and be proactive in moving towards a professional life and/or further study
* To help apprentices to make best use of the feedback they have received so that they can build on their strengths and take steps to address any weaknesses

**Contact:**

* Regular one-to-one meetings from week 1
* Email contact at the end of teaching block 1
* Individual ‘wrap up’ email at end of academic year

The application of skills closely linked to the Personal Tutor Scheme is key requirement of the work-based learning module **CE6314 Individual Project and Research Methods.** In this module, apprentices are enabled to make connections across various other modules and undertake a research project tailored to situations they face at their work place. In doing so, they are required to demonstrate a range of employability skills including independent and analytical thinking, problem-solving and advanced communication and literacy.

Personal Tutors would have access to all the formative and summative assessment results of their tutees and would be responsible to discuss them with their tutees and assist them to prepare plans for further improvements and advise on any academic issues they may have. The personal tutors are also responsible for giving a bigger and more complete picture of learning, teaching, learning outcome and assessment and their linkage to the tutees.

1. **Ensuring and Enhancing the Quality of the Course**

The University has several methods for evaluating and improving the quality and standards of its provision. These include:

* External Examiners
* Boards of Study with apprentice representation
* Annual review and development
* Periodic review undertaken at the subject level
* Apprentice evaluation
* Moderation policies

The School interfaces with several professional bodies in the context of annual monitoring and periodic reviews and these provide other opportunities for reflection and external contribution to course design and quality assurance and enhancement. Employer liaison groups which take varying forms also provide the opportunity for external input to the quality assurance and enhancements of the School’s programmes.

1. **Employability Statement**

This curriculum embeds the development of employability skills throughout the Course and is designed to equip apprentices with the ability to relate the knowledge and skills that they have learnt to real world contexts.

Initially apprentices are guided towards learning about employability skills and career pathways, but as they move through the course they are expected to become more independent and take ownership of their career development by engaging with classes provided by KU Talent, including; Professional Communication, Time and Self-Management and Identifying and Articulating Skills. There are also opportunities to perfect skills required to gain employment such as; CV writing, Psychometric Test and Using LinkedIn. An apprentice’s development and career options are discussed in personal tutor meetings and guidance given as appropriate. This is in liaison with the KU Talent team, the University’s Careers Service.

The apprentice’s development of career management skills is supported by an Industrial Liaison Officer (ILO) who liaises with KU Talent as and when necessary. The KU Talent supports apprentices in preparation of CVs and letters of application. Furthermore, the Ku Talent arranges career fairs from leading employers (two or three times a year) who talk to apprentices about work in the construction industry and skills required. With these visitors, apprentices have the opportunity to have mock and/or real interviews as well collect information that helps them in career decision making.

Graduates develop careers in all branches of the construction industry, in the UK and throughout the world; as contractors and consulting engineers, and within local authorities, water authorities, government organisations, businesses and the defence industry. The academic and key skills developed throughout a construction course also allow graduates to follow careers in other professions such as ICT, finance, surveying and teaching. In addition, a number of graduates will progress to MSc courses in construction-related specialist areas before continuing their career in industry or research.

1. **Approved Variants from the Undergraduate Regulations**

None

1. **Other sources of information that you may wish to consult**

Subject benchmark

<http://www.qaa.ac.uk/assuring-standards-and-quality/the-quality-code/subject-benchmark-statements/honours-degree-subjects>

Professional Body:

[www.ciob.org](http://www.ciob.org)

**Development of Programme Learning Outcomes in Modules**

This table maps where the programme learning outcomes are assessed across the twelve BSc modules. It provides an aid to academic staff in understanding how individual modules contribute to the programme aims, a means to help apprentices monitor their own learning and personal and professional development as the programme progresses, as well as a checklist for quality assurance purposes.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | **Level 4** | **Level 5** | **Level 6** |
|  | **Module Code** |  | EG4010 | EG4020 | EG4030 | EG4040 | CE5211 | CE5104 | CE5213 | EG5014 | CE6211 | CE6212 | CE6113 | CE6314 |
| **Programme Learning Outcomes** | **Knowledge & Understanding** | A1 |  | S |  | S | S |  | S | S | S |  |  | S |
| A2 | S | S |  | S |  | S | S |  | S |  | S | S |
| A3 |  | S | S | S | S |  | S |  | S | S | S | S |
| A4 |  |  |  |  | S |  |  |  | S | S | S |  |
| A5 |  | S | S |  | S | S |  |  | S |  | S |  |
| A6 | S | S |  | S | S |  | S | S | S |  | S | S |
| **Intellectual Skills** | B1 | S |  |  |  | S | S | S | S | S |  | S |  |
| B2 |  | S |  | S |  | S |  |  | S |  |  |  |
| B3 |  |  |  |  |  |  | S |  | S | S | S | S |
| B4 | S |  | S |  | S |  |  |  | S | S |  |  |
| B5 | S | S |  | S |  |  |  |  | S | S | S |  |
| B6 |  |  | S |  |  | S |  |  | S | S |  |  |
| **Practical Skills** | C1 |  |  |  |  |  | S |  | S |  |  |  |  |
| C2 |  |  |  |  |  | S |  | S | S |  |  |  |
| C3 |  |  |  |  |  | S |  | S |  |  |  |  |
| C4 | S |  |  |  | S | S | S | S | S | S | S | S |
| C5 | S |  |  |  | S | S | S |  | S |  |  |  |
| C6 |  |  |  |  | S | S |  |  | S | S |  |  |

**S**  indicates where a summative assessment occurs.

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**Apprentices will be provided with formative assessment opportunities throughout the course to practise and develop their proficiency in the range of assessment methods utilised.**

**Technical Annex**

|  |  |
| --- | --- |
| **Final Award(s):** | BSc (Hons) Construction Management |
| **Intermediate Award(s):** | Cert HE in Construction ManagementDip HE in Construction Management |
| **Minimum period of registration:** | PT= 5 years (Direct entry to Level 5= 3 years) |
| **Maximum period of registration:** | PT= 10 years (Direct entry to Level 5= 6 years) |
| **FHEQ Level for the Final Award:** | Level 6 |
| **QAA Subject Benchmark:** | Land, Construction, Real Estate and Surveying |
| **Apprenticeship Standard:** | Institute for Apprenticeships Chartered Construction Site Management (Degree) Standard (ST0047) |
| **Modes of Delivery:** | Apprenticeship Day Release |
| **Language of Delivery:** | English  |
| **Faculty:** | Science, Engineering and Computing |
| **School:** | Engineering |
| **Department:** | Construction and Surveying |
| **Course/Route Code:** | UPCMN1CMN77 |
|  |  |
|  |  |

**APPENDIX**

**BSc (Hons) Construction Management – Course diagram**

**APPRENTICESHIP DAY RELEASE**

 **YEAR 1 OF 5 YEAR 2 OF 5 YEAR 3 OF 5**

 **TB1 TB2 TB1 TB2 TB1 TB2**

CE5112

Site & Engineering Surveying

30 credits

30 credits

EG4010

Engineering Design and Professional Practice

30 credits

EG4030

Applied Mathematics and Computing Applications

30 credits

CE5211

Construction Business and Law

30 credits

EG4040

Construction Management and Site Investigation

30 credits

EG4020

Structures, Materials and Construction Methods

30 credits

CE5213

Materials Design and Procedures

30 credits

**APPRENTICESHIP DAY RELEASE (cont.)**

 **YEAR 4 OF 5 YEAR 5 OF 5**

 **TB1 TB2 TB1 TB2**

CE6211

Site Practice and Management

30 credits

30 credits

CE6314

Individual Project and Research Methods

30 credits

CE5014

Engineering Project Management

30 credits

CE6113

Building and Environmental Engineering

30 credits

CE6212

Contractual Procedures

30 credits