Template C4

Kingston University London

Programme Specification

Title of Course: *MEng Civil Engineering*

Date first produced	24/07/2023
Date last revised	20/09/2024
Date of implementation of current version	01/09/2024
Version number	8
Faculty	Faculty of Engineering, Computing and the Environment
School	School of Built Environment and Geography
Department	Department of Geography, Geology & the Environment
Delivery Institution	Kingston University

This Programme Specification is designed for prospective students, current students, academic staff and employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes and content of each modules can be found in the course VLE site and in individual Module Descriptors.

SECTION 1: GENERAL INFORMATION

Award(s) and Title(s): ***Up to 10 pathways***	MEng Civil Engineering
Intermediate Awards(s) and Title(s): ***There are 4 Intermediate awards for each pathway***	Cert HE BEng Civil Engineering Dip HE BEng (Hons) Civil Engineering
Course Code ***For each pathway and mode of delivery***	UFCEE1CEE80
UCAS code ***For each pathway***	

RQF Level for the Final Award:	
Awarding Institution:	Kingston University
Teaching Institution:	Kingston University
Location:	
Language of Delivery:	English
Modes of Delivery:	Full-time With Professional Placement
Available as:	Full field
Minimum period of registration:	Full-time - 4 With Professional Placement - 5
Maximum period of registration:	Full-time - 8 With Professional Placement - 10
Entry Requirements:	The minimum entry qualifications for the programme are: - UCAS tariff points: 128-136: • From A levels: A-level (or equivalent) in Mathematics at grade B or above. General studies and Native language at both A-Level and AS Level not accepted in the tariff. • From BTEC: BTEC Level 3 Extended Diploma in Engineering with Distinction, Distinction, Merit (DDM) including Construction and Built Environment, including minimum Distinction in Maths and Further Maths • T Level- Distinction in Design, Surveying and Planning for Construction to include minimum of a C in the Core and a Merit in

	the Occupational Specialism in Civil Engineering. - Candidates are normally required to hold five GCSE subjects at grade C/4 or above, including Mathematics and English Language. - Direct entry to level 5 of the MEng is not normally permitted. - All non-UK applicants must meet our English language requirements. For this course it is Academic IELTS of 6.0, with no element below 5.5. - Entry is normally at Level 4 with A-level or equivalent qualifications (See section D). - Transfer from a similar course is possible at - Intake is normally in September.
Programme Accredited by:	This degree is to be accredited by the Joint Board of Moderators (JBM) comprising the Institution of Civil Engineers, Institution of Structural Engineers, Institute of Highway Engineers, the Chartered Institution of Highways and Transportation and the Permanent Way Institution on behalf of the Engineering Council (Accreditation of Higher Education Programmes) for the purposes of fully meeting the academic requirement for registration as a Chartered Engineer (CEng). See www.jbm.org.uk for further information and details of Learning programmes for CEng.y
QAA Subject Benchmark Statements:	QAA subject benchmarks for Engineering (March 2023)
Approved Variants:	Yes, we have approved variants required to meet the new Engineering Council compensation-and-condonement-policy Yes, we have an approved variant to allow 4 *15-credits modules per level at (Levels 4, 5, 6 & 7)
Is this Higher or Degree Apprenticeship course?	

For Higher or Degree Apprenticeship proposals only	
Higher or Degree Apprenticeship standard:	n/a

Recruitment, Selection and Admission process:	n/a
End Point Assessment Organisation(s):	n/a

SECTION 2: THE COURSE

A. Aims of the Course

Civil Engineers have to always keep pace with the 'developments' around the world in order to meet the demands of a rapidly changing world, including respond to climate change emergency. The MEng/BEng Civil Engineering is designed to equip graduates with the underpinning knowledge, skills and professional behaviours that expected from civil engineers to design, build and shape the world around them. Graduates from these Civil Engineering programmes will be capable of addressing the needs of society and business, including, having the ability to familiarise themselves with changes in digital technology; being able to deploy engineering methods and technologies to create virtual models of their engineering designs; being skilled in solving complex engineering challenges; being effective in mitigating climate change impacts on infrastructure and human society; having the ability to influence choices around carbon use and emissions across the sector. These learning and skills outcomes will be achieved by a range of specialist taught modules in the programmes and by drawing on the internationally renowned research expertise at Kingston University London (KU).

The MEng is an industry recognised high calibre undergraduate course that prepares the student for the job market. Offering such a course will align with the KU22+ strategic plan. The MEng fully meets the exemplifying academic benchmark requirements for registration as a Chartered Engineer (CEng). This being the professional recognition that is sought after by many engineers.

Aims of the Course

The general aim of the programme is to:

- Equip graduates with engineering science, design, management, business and interpersonal skills required to become a professional Civil Engineer, as well as to enable them to follow careers in other professional disciplines where clear, logical, numerate skills in combination with the ability to solve problems, communicate solutions and work in teams are valued.

More specific aims of the programme are to:

- Produce graduates with a good design capability together with the required breadth and depth of theoretical and practical knowledge of established technologies and methods in Civil Engineering.
- Enable graduates to develop analytical and problem-solving skills and to evaluate evidence and assumptions to reach sound judgements and communicate these effectively.
- Inculcate a deep understanding of engineering principles that prepare graduates with a creative approach to the solution of civil engineering challenges and the requisite technical skills to realise these solutions with responsibility for project management.
- Equip graduates with the research skills required for postgraduate study and employability skills required for work in the civil engineering and the built-environmental fields.
- Furnish graduates with a firm grasp of design, sustainability, health and safety risk management, professionalism, ethics and inclusion practice principles.
- Develop skills in problem solving, communication, information retrieval, working with others and the effective use of technologies.

- Plan and carry out a personal programme of work, adjusting where appropriate, and develop the capacity for independent study and lifelong learning.

B. Intended Learning Outcomes

The course learning outcomes are referenced to the QAA subject benchmarks for Engineering (2023) and the Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (2014) relating to the typical student. The learning outcomes are aligned with the levels set out in Sector Recognised Standards in England (OFS 2022).

The course provides opportunities for students to develop and demonstrate knowledge and understanding specific to the subject, key skills and to a graduate attribute in the following areas:

The Key Skills fall within the nine categories defined within the University's Future Skills Framework for undergraduate and postgraduate courses. Courses will normally be expected to incorporate all categories of these skills within the programme specification, together with evidence relating to where they are facilitated and how they are to be assessed. Skills are progressed as appropriate for the discipline and level of the student.

In addition, the defined learning outcomes are mapped to those published by the Engineering Council in the UK Standard for Professional Engineering Competence (UK-SPEC): The accreditation of Higher Education Programmes - Fourth edition.

The programme learning outcomes are the high-level learning outcomes that will have been achieved by all students receiving this award. They must align to the levels set out in the 'Sector Recognised Standards in England' (OFS 2022).

Programme Learning Outcomes					
	Knowledge and Understanding On completion of the course students will be able to:		**Intellectual Skills** On completion of the course students will be able to		**Subject Practical Skills** On completion of the course students will be able to
A1	Demonstrate knowledge and understanding of scientific principles and methodologies necessary to underpin their education in civil engineering. (to enable appreciation of its scientific and engineering context, as well as devising sustainable, safe, economical and creative practical solutions)	B1	Apply fundamental theoretical studies of scientific and mathematical principles that underpin engineering and specifically civil engineering, to a broad range of real-world problems.	C1	Use laboratory and workshop equipment for experimental investigation and evaluate data to produce, practically, valuable results
A2	Demonstrate knowledge and understanding of materials, structures, geotechnics, hydraulics, surveying, water, highway, transportation and environmental engineering	B2	Use mathematics as a tool for solving complex problems, communicating results, concepts and ideas	C2	Undertake fieldwork and analyse the data obtained for use in planning and design
A3	Demonstrate knowledge and appreciation of broader technical and non-technical engineering subjects	B3	Think creatively and imaginatively to solve design problems and manage continuous improvement through quality management	C3	Use a range of complex technical equipment and instruments, and work with information that may be incomplete or uncertain and quantify the effect of this on the design and construction.
A4	Relate management and business applications to civil engineering	B4	Manage projects, people, resources and time taking account of legal and statutory requirements, risk, safety, quality and reliability	C4	Use computer technology to assist with information retrieval, management and communication, recognising the appropriate software that supports analysis, design and digital construction.

A5	Demonstrate understanding of the importance of Risk and Health and Safety in the engineering industry	B5	Demonstrate a positive attitude to learning that encourages continuing professional development throughout their careers	C5	Comply with Health and Safety regulation and procedure in practical engineering situations
A6	Relate all their studies to a knowledge and holistic understanding of sustainability including social, economic and environmental aspects as well as the effect of global challenges (presented by climate emergencies and environmental assessments)	B6	Recognise the importance of professional bodies and develop the professional conduct expected of Professional Engineers	C6	Work independently or as part of a team to initiate, investigate, plan, manage and drive projects to a successful conclusion and produce the associated documentation (communicating proposals, plans, reports, presentations to technical and non-technical audiences).

In addition to the programme learning outcomes, the programme of study defined in this programme specification will allow students to develop the following range of Graduate Attributes:

1. Creative Problem Solving
2. Digital Competency
3. Enterprise
4. Questioning Mindset
5. Adaptability
6. Empathy
7. Collaboration
8. Resilience
9. Self-Awareness

C. Outline Programme Structure

Full details of each module will be provided in module descriptors and student module guides.

MEng Civil Engineering

Level 4							
MEng Civil Engineering							
Core modules	**Module code**	**Credit Value**	**Level**	**Teaching Block**	**Pre-requisites**	**Full Time**	**Part Time**
Fluid and Soil Mechanics	CE4011	30	4	TY13	None	1	
Introduction to Mechanics & Materials	CE4025	15	4	TB2	None	1	
Mathematics & Engineering Analytics	CE4024	15	4	TB1	None	1	
Navigate for Professional Engineers	CE4021	15	4	TB1	None	1	
Structural Analysis & Design	CE4023	30	4	TY13	None	1	
Sustainability for professional practice	EG4022	15	4	TB2	None	1	
Optional Modules							

Progression to Level 5

Progression to Level 5 requires 120 credits including passes in all Level 4 modules.

This course permits progression from level 4 to level 5 with 90 credits at level 4 or above. The outstanding 30 credits from level 4 can be trailed into level 5 and must be passed before progression to level 6.
Students exiting the course at this point who have successfully completed 120 credits at level 4 or above are eligible for the award of Certificate of Higher Education in Civil Engineering.

Level 5							
MEng Civil Engineering							
Core modules	**Module code**	**Credit Value**	**Level**	**Teaching Block**	**Pre-requisites**	**Full Time**	**Part Time**
Digital Construction & Building Information Modelling (BIM)	CE5020	15	5	TB1	None	2	
Engineering Geodesy and GIS	CE5022	15	5	TB2	None	2	
Exploring Engineering Project Management	CE5034	15	5	TB2		2	
Geotechnics & Materials	CE5024	30	5	TY13	None	2	
Hydraulics & Water Engineering	CE5021	15	5	TB1	None	2	
Structural Analysis & Design 2	CE5023	30	5	Ty13	None	2	
Optional Modules							

Progression to Level 6

Progression to level 6 requires 120 credits including passes in all Level 5 modules.
This course permits progression from level 5 to level 6 with 90 credits at level 5 or above. The outstanding 30 credits from level 5 can be trailed into level 6.
Students exiting the programme at this point who have successfully completed 120 credits at level 5 or above are eligible for the award of Diploma of Higher Education in Civil Engineering.

Level 6							
MEng Civil Engineering							
Core modules	**Module code**	**Credit Value**	**Level**	**Teaching Block**	**Pre-requisites**	**Full Time**	**Part Time**
Advance Structural Modelling & Design	CE6020	30	6	TY13	None	3	
Applied Business Management	EG6026	15	6	TB1		3	
Highway, Transport & Traffic Engineering	CE6024	15	6	TB1	None	3	

Individual Research Project	CE6026	30	6	TY13	None	3	
Integrated Design project	CE6027	15	6	TB2	None	3	
Optional Modules							
Geotechnical & Environmental Engineering	CE6021	15	6	TB2	None	3	
Geotechnical Engineering & Geomorphological Hazards	CE6022	15	6	TB2	None	3	
Geotechnical Engineering & Geophysical Hazards	CE6023	15	6	TB2	None	3	

Level 7							
MEng Civil Engineering							
Core modules	**Module code**	**Credit Value**	**Level**	**Teaching Block**	**Pre-requisites**	**Full Time**	**Part Time**
Advance Dynamic Analysis and Seismic Design	CE7701	15	7	TB2	None	4	
Digital Technologies and Construction Modelling	CE7720	15	7	Tb1	None	4	
Integrated Design Project	EG7000	60	7	TY13	None	4	
Management of Project Risk, Quality and Safety	CE7011	30	7	TB1	None	4	
Optional Modules							
Administration of Construction Contract	CE7723	15	7	TB2	None	4	
Design of Concrete Structures	CE7721	15	7	TB2	None	4	
Design of Steel Structures	CE7729	15	7	TB2	None	4	
Legal Obligations and Regulatory Context	CE7728	15	7	TB2	None	4	

D. Principles of Teaching, Learning and Assessment

The MEng Civil Engineering course has been designed, considering the Kingston University Curriculum Design Principles, to help develop students into graduates that are professional, thoughtful, creative, resilient, proactive and globally aware independent, equipping them to be lifelong learners.

Overarching principles

The course is designed to the principles of the KU Townhouse Strategy. All students on the course 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 may not be mentioned specifically in many of the titles of modules, however, the principles of regenerative design, intervention which has societal benefit, and sustainable development are reflected in the learning outcomes, and it underpins all that we teach and the way we encourage students to approach their own learning in a reflective way seeking to find themselves as individuals.

The role of teaching and assessment is to underpin student learning and throughout the programme the strategy is to engage students with a wide range of activities that enable them to develop the knowledge, skills and professional competencies that they will need as practitioners alongside their knowledge base. The student should, as far as practicable, be empowered to take responsibility of their learning but be supported strongly through the process. It follows that as the student progresses through the levels the emphasis will be from lecturer-led to student-led work though lectures will 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 students will be led through the materials and required to develop their skills through the tasks set. Field trips and site visits are therefore key components of the strategy and support sessions aimed at skills development are an important part of the delivery strategy.

Teaching & Learning

A solid and comprehensive technical and professional knowledge base is an essential component 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 descriptors set out clear expectations for guided independent learning. Students will be directed to reading and Technology Enhanced Learning (TEL) packages to prepare for individual topics or sessions and also to problem sets or exercises to consolidate and test their learning afterwards. This will be introduced at level 4. The Virtual Learning Environment (VLE) at Kingston will support learning throughout the course through a variety of TEL objects such videos, screencasts, on-line discussion boards and interactive teaching packages. It will also deliver teaching material such as lecture notes/presentations, problems set and worked examples to reinforce the students learning and helps them to understand how construction elements are put together. This helps support an inclusive approach as students 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. We recognise that an ability to be comfortable with a range of digital media is important to employability skills and

effective learning. Students also need to be computer literate and able to operate industry standard computer packages.

Development of Independent learning through the course

The learning, teaching and assessment strategy of the course is aimed at supporting progression in curriculum content and skills development through the levels of study. At level 4 there is a clear structure and guidance for students' learning with an emphasis on the acquisition of fundamental engineering knowledge and skills (Mathematics and IT in CE4024 Mathematics & Engineering Analytics), practical skills (CE4025 Introduction to Mechanics & Materials) and, (CE4011 Fluid and Soil Mechanics) and the initial development of key employability skills (CE4021 Navigate for the Professional Engineer). This provides a solid foundation for students to undertake a deeper study in a specific engineering discipline at level 5. At level 5 there will be an increased expectation of independent study, supported by a reduced emphasis on the use of lectures. At level 6 students will be expected to take greater ownership of their independent study with academics taking on more of a supervisory role of student independent study, this is exemplified in the group and individual project modules CE6027 Integrated Design Project and, CE6025 Individual Research Project. At Level 7, the Capstone module is the multi-disciplinary EG7XXX Integrated Group Design Project. With a suite of core and optional modules covering wide advanced specialised technical and professional subjects.

Integrated and interdisciplinary collaboration

In line with KU Future Skills strategy and the development of students' professional competencies and core values, all undergraduate students within the School of Built Environment and Geography at Kingston University take two (15 credit) common modules at Level 4 namely (CE4021 Navigate for the Professional Engineer) and (EG4022 Sustainability for Professional Practice). This provides opportunity to study and work with students from different disciplines is a distinct feature of the course at Kingston University. In CE4021, students will be able to demonstrate the ability to plan their personal development and to use graduate attributes to explore problem within the specific discipline context. In EG4022, students able to focus on the 21st century environmental and climate change challenges at the same time to unleash the interconnectedness among topics such as United Nation Sustainable Development Goals (UNSDGs), Net Zero Carbon and Circular Economy whilst identify approaches to problem-solving in a real-world scenario.

The CE4021 module is extended into the Level 5 in (EG5016 Exploring Engineering Project Management) where students will be able to demonstrate the ability to critically evaluate their own personal development through reflection on their progress and goals, and at the same time demonstrate the use of graduate attributes to explore problems beyond the discipline.

In addition, at Level 5, students will have the opportunity to collaborate with students from Construction engineering management, Building Surveying and Quantity Surveying in (CE5020 Digital Construction & Building Information Modelling (BIM)) where students have the opportunity for interdisciplinary Project-based Learning (PjBL) applying BIM and data management techniques and present solutions to small scale engineering/project challenges. This will give the students an opportunity to talk

about how they have worked with an external company on a construction engineering problem as part of a team, when they apply for an industrial placement.
The (EG5016 Exploring Engineering Project Management) module further scaffolds into the Level 6 in (EG6026 Apply Business Management) where students will be able to demonstrate the ability to set goals and take action relating to their development and future plans, and at the same time demonstrate the use of their graduate attributes to explore complex challenges beyond the University.

In addition, at Level 6, students will continue to have collaboration with students from Other Engineering discipline in (EG6026 Apply Business Management) where students develop further their interdisciplinary group working through Project-based Learning (PjBL) demonstrating the range of skills underpin successful project delivery client care, market analysis, business context and risk management. Students will have opportunities to develop interpersonal skills to facilitate collaborative working practices including conflict management and avoidance techniques.

In Level 7, the ultimate multidisciplinary cooperation is manifested in (EG7XXX Integrated Group Design Project)

Focus on active learning and enhancing student engagement

A feature of the learning, teaching and assessment strategy in the school of is that many instructional lectures have been replaced by collaborative, problem solving, design thinking and/or enquiry-based learning workshops and tutorials. These require students to prepare for, and participate in, the classroom activities, rather than passively listening to the lecturer. Students 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 students with opportunities for peer learning, group work and presentation practice.
Examples of interactive sessions can be found in all modules at all levels where students are offered a highly interactive enquiry-based environment to solve realistic civil engineering problems. In these sessions the lecturer facilitates learning by supporting students in creating their own knowledge and understanding. Lecturers may also introduce and summarise key concepts with mini lectures. Project based Learning (PBjL) is introduced in EG4022 Sustainability for Professional Practice and developed further in CE5020 Digital Construction & Building Information Modelling (BIM). These collaborative activities encourage students to draw on their own set of experiences and cultural backgrounds when tackling real world challenges.

Future Skills and Graduate Attributes are identified and explored directly throughout the course in CE4021 Navigate for the Professional Engineer, EG5016 Explore and EG6026 Apply within the discipline context where at Level 4 these are linked to the Learning to Learn where students identify their learning targets from Induction to graduation; beyond the discipline at Level 5 which includes an inter-departmental team sustainability design project; beyond the university at Levels 6 & 7 which is to foster a bridge to the wider professional communities of practice for the student's subject discipline.

Active and collaborative learning is also incorporated in lectures which may have question-and-answer sessions, brief student discussions, Mentimeter activities

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

Hands-on Practical work

A hand on practical experience in workshops and laboratories is fundamental in developing practical skills as well as enhancing data collection and analysis skills. Students will have the opportunity to work in laboratories and workshops as well as field trips in most of their modules. Practical work is closely related to the taught content to provide context for the theoretical work. At level 4 students are introduced to basic skills of measuring, interpreting and recording experimental data and how to apply these in a laboratory environment and present the results with (CE4025 Introduction to Mechanics & Materials) and (CE4011 Fluid and Soil Mechanics). Complying with Health & Safety requirements when in the lab is paramount. At level 5 the focus is on further testing and measurement of a variety of parameters in support of more level 5 concepts delivered in lectures with CE5021 (Hydraulics and water Engineering), CE5023 (Structural Analysis & Design 2) and CE5024 (Geotechnics & Materials). This is delivered through supervised practical sessions with experiment protocols. At level 6 students and expected to select and apply requisite practical skills in their own independent research work in (CE6025 the Individual Research Project) module. At Level 7, the Capstone module is the multi-disciplinary EG7XXX Integrated Group Design Project is one that employs the concept of Hands-on in a real-world design project environment.

Academics are committed to practical fieldwork, encouraging students to acquire fieldwork skills, including health and safety, group coordination and management. This programme includes a number of field excursions, modules that include field work include: CE5022 (Engineering Geodesy and GIS), CE6021 (Geotechnical & Environmental Engineering). Site visits are arranged for groups of students whenever possible (levels 5, 6 & 7) and are important in understanding the practical application of their academic work, as well as an appreciation of the students' employability prospects.

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.

A formal arrangement exists with a selection of engineers in full-time practice who generously give their time to support the department through the work of the Industrial

Advisory Board. This Board meets with senior School staff two times per year to discuss policy and course structure in the department. Some deliverables of the IAB include guest lectures (structures, H&S, sustainability, professional practice), course design (e.g. embedding JBM threads, relevance of skills to employability), research (co-supervision, subjects, KTPs), student placements and JBM visits. Industrial Members have been chosen to reflect both the various courses offered by the Department and the types of organisations for which many of our graduates end up working. We have, therefore, industrial members who are representative of both consultancy organisations – representing both international, and locally based companies, and contracting organisations – representing both major and smaller contractors. In addition, these industrial members have a range of professional qualifications including membership of Professional Engineering Institution. Our students take full advantage by being in continuous contact with the IAB members via mentoring by them, presenting their work to them, placements, applying for vacancies, IAB award, etc. including the yearly award for the best student by the Institution of Civil Engineers.

The majority of the course team are either engineering research active or are involved in industry related professional activities, through KTPs or other direct involvement with industry. These activities played a major part in informing the course design and content, as did the direct input from industry through the activities of the Industrial Advisory Board. At Kingston, research in the field of Civil Engineering has in recent years been concentrated in the areas of (i) structures and materials (concrete and sustainable materials) and (ii) geotechnical and hydraulic engineering science. Most of the teaching staff are also actively involved in the various Research Centres and/or Research Groups of the Faculty or may be following interest areas of their own. These activities take them into, amongst other areas, advanced structural design, sustainable construction, composite materials, fire and blast resistance, earthquake engineering, geology and geotechnics, etc. Modules are mainly taught and managed by academic staff that are engaged in research in various areas and include their research findings in addition to well established principles, for example in module (CE6027 integrated Design Project) subject areas such as structures under complex loadings, Finite Elements, pre-stressed concrete, slope stabilisation, deep foundations, etc. are introduced (e.g., CE6020 (Advanced Structural Modelling & Design). All the modules at the final year (Level 7) are addressing advanced technical and professional subjects that addresses the state of the art and incorporates the up-to-date advancements in these subjects.

Students are encouraged to develop their own research skills which are a fundamental part of the curriculum throughout all levels of the programme. They are often encouraged, through project work, to work with research active staff on elements of live projects, and these research skills enable students to determine, distinguish and present appropriate evidence in an argument, which is of great value to employers.

Academic staff are also engaged widely with the research and development of ideas in teaching and learning in Higher Education and into wider pedagogic issues which will then feed through to support learning in lectures and other forms of student engagement the programme, both formal and extra-curricular. As parts of pedagogic research computing resources in fundamental subjects such as Maths and Mechanics/Physics have been developed and been embedded into VLE system. The

use of an Electronic Voting System in the classroom for summative and formative assessments is another example of pedagogic research undertaken by the teaching staff. This reflective, evidence-based professional practice by academic staff serves as exemplar to students in their future professional practice.

Development of Graduate Attributes and Future Skills

To complement the development of Graduate Attributes and Future Skills within the curriculum, Personal tutors will encourage students to engage in a range of extra-curricular activities such as student representation, part-time work, sports and recreation, society membership, volunteering ; student ambassadorship, leadership and mentoring; cultural and creative activities; academic and professional collaboration; placement activity; enterprise activity; Careers and Employability events and opportunities. Activity in these areas is recognised by the university's Kingston Award Scheme. Careers and Employability Service offers a range of events, including Careers Uncovered fairs, which include employers coming to campus to promote internship, placement and graduate opportunities, Spotlight on engineering networking activities where employers and alumni are invited on campus to talk about career pathways.

Assessment for Learning

The assessment strategy has been designed to help students to learn and prepare them for employment, rather than just a tool to measure their learning. The assessment is designed to be authentic, inclusive and transparent. The assessment tasks focus on the real-world engineering activities that enhance students' employability. All module assessments are related to real world problems. All modules have explicit formative assessments to provide opportunities for practice and the chance to use 'feed forward' to help students improve their work in subsequent summative assessments. For example, in some modules, formative assessment is provided in the form of quick, regular and detailed feedback on laboratory reports facilitating improvement of these reports throughout the academic year.

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. This is reflected in the decreasing use of assessment by examination at levels 4, 5 to level 6. The use of a well-balanced range of assessment methods is key part to of our inclusive assessment strategy. Group and teamwork assessment is instrumental in developing and recognising this important employability skill. For example, students study fundamental principles of structural mechanics and then demonstrate their applications in different practical examples of analysing structures in group work presentations at Level 4, e.g., understanding the principle of statics and equilibrium leads to its application i.e., ability to use statics and equilibrium in analysing a roof truss. Similar examples follow at levels 5, 6 & ultimately 7. This demonstrates progressive skills and competences development – thus preparing employment ready graduates.

Inclusive Curriculum, Teaching and Assessment Practices

The school implements an inclusive curriculum framework that is guided by three key principles: create an accessible curriculum; enable students to see themselves

reflected in the curriculum; and equip students with the skills they need to positively contribute to and work in a global and diverse environment. In line with this framework, this MEng course learning outcomes are clear, accessible and structured to be incremental and attainable. Care is taken to ensure that the learning outcomes do not present any barriers to particular social groups. On a practical level, the learning outcomes cover multiple perspectives of civil engineering practices and is designed to accommodate experiences of individuals from multiple cultures, international setting and backgrounds.

Learning content covers the knowledge, skills and competencies required for working in a wide range of subdisciplines and projects and from retrofitting old infrastructure to the sustainable design and construction of new builds in various regions and contexts. The School also, recognises and values that students learn in different ways. The course curriculum therefore incorporates a wide variety of methods for delivering learning, including, lectures, tutorials, workshops, seminars, practical sessions, computing sessions, site visits, and field trips. Active learning exercises are typically embedded into lecture sessions to actively and experientially involve students in the learning process. Exercises include small group discussions, debates, role play, case studies, games, and flipped learning exercises appropriately aligned with the learning objectives for the session. Learning materials are made available in a variety of formats on Canvas, the School's Virtual Learning Environment (VLE). These could be in the form of lecture slides, lecture notes, recorded lectures, podcasts, videos, suggested reading material, self-assessment quizzes, discussion boards, and solutions to tutorial problems.

Student Voice Committees and School Education Committee provide opportunities for student to make suggestion on how to develop a more inclusive curriculum by taking into account the specific circumstances of the student body. The variety of teaching activities also takes account of the student's 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 students have an opportunity to interrogate the criteria.

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

- Practical exercises: to assess students' 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 students 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 module represents an opportunity for students 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
- Posters: The group project is presented in posters to / and assessed by academic staff as well as members of the industrial advisory board.
- Model building: in the first year, where students make a structure with little wooden sticks and tape e.g., a small bridge and load it to breaking point.
- Short in-class tests and on-line assessments: throughout a number of modules.

At the beginning of each academic year deadlines for submission and feedback are planned carefully and a full "assessment timeline calendar**"** is constructed to ensure that there is no summative assessment bunching and thus student workloads are managed. In addition, this calendar is then presented to the cohorts for consultation before it is formally fixed. The calendar then offers a synchronised and coherent delivery of the programme that is clearly understood by staff and students who can appreciate the integrated nature of their learning emanating from various module assessments.

E. Support for Students and their Learning

Students are supported by:
The Personal Tutor (PT) scheme is central to the efforts to provide a personalised learning experience (See PT section of programme specification). Students are supported by:

- **A Module Leader** for each module
- **A Course Leader** to help students understand their programme structure and provide academic support.
- **A Personal Tutor** (PT) to foster a close and engaged academic relationship with students and advise and refer students to other University services.
- There is a **Student Support and Engagement Team** to help students with any problem that is affecting their studies.
- Undergraduate **Course Administrators**
- **An induction/re-induction programme** and study skills sessions at the start of each academic year
- **Academic Success Centre** is a one-to-one drop-in Study Skills session for students 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**
- **A University Future Skills Employability Team,** Future Skills Employability Team - ECE
- Comprehensive University support systems including the provision of advice on finance, regulations, legal matters, accommodation, international student support, disability and equality support.
- **Union** of Kingston Students

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 Built Environment & Geography. It is intended that the PTS is embedded within the modular provision of the MEng Course.

Aims

- To build a rapport between staff and students and contribute to personalising students' experience within the School of Built Environment & Geography.
- To support students in the development of their academic skills providing appropriate advice and guidance to students throughout their time at Kingston, while monitoring their progress, helping to identify individual needs and referring students to other University services as appropriate.
- To help students to develop the ability to be self-reliant and confident self-reflective learners who use feedback to their best advantage.
- To encourage students 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 student numbers being equally divided amongst the staff within the school.
- Students will keep the same tutor throughout their course of study.

Assessment

The PTS is embedded in core curriculum modules at each of the first 3 levels of undergraduate study:

Level 4 – CE4021 Navigate for the Professional Engineer
Level 5 – EG5016 Exploring Engineering Project Management
Level 6 – EG6026 Apply Business Management

There are specific aims and outcomes for each level that will be assessed, as the PTS is a progressive and cumulative scheme building on the skills developed in previous levels.

At level 4 (CE4021 Navigate for the Professional Engineer), Students will complete a digital skills portfolio that will include problem solving and design thinking, team-working, personal development planning and evidence of engagement within their learning and professional community. The digital portfolio will be linked to PTS-supported exercises including:

1. Demonstrate the ability to plan your personal development through reflection on a skills diagnostic.

2. Demonstrate use of the graduate attributes to explore problems within the context of your discipline.
3. Demonstrate an understanding of key professional competencies including the role of the Professional Engineer and society, key sustainability challenges, EDI, ethics, health and safety and risk management.

At level 5 (EG5016 Exploring Engineering Project Management), Students will complete a digital skills portfolio. A major element of the digital skills portfolio will be to systematically track the progress of the interdisciplinary project and reflect on the professional lessons learned. The digital portfolio will be linked to PTS-supported exercises including:

1. Demonstrate the ability to critically evaluate your own personal development through reflection on your progress and goals.
2. Demonstrate use of the graduate attributes to explore problems beyond the discipline.
3. Explore and apply engineering project management principles and techniques in the context of wider business operations, including risk management, health and safety, sustainability, EDI, ethics, and develop professional competency in the communication of ideas.

At Level 6 (EG6026 Apply Business Management), Students will complete a digital skills portfolio. A major element of the digital skills portfolio will be to formulate and systematically track the experiences acquired through participation in at least three networking activities in the final year. Dialogic formative feedback will be provided on entries within the digital portfolio by the personal tutor. The digital portfolio will be linked to PTS-supported exercises including:

1. Evaluate the environmental and commercial impact of managerial decisions with reference to stakeholders, Corporate and Social Responsibility (CSR), Environmental Social and Governance (ESG) and Sustainability.
2. Demonstrate the ability to set goals and take action relating to your development and future plans.
3. Demonstrate use of the graduate attributes to explore complex challenges beyond the University

The use of Future Skills and Graduate Attributes through **CE4021 Navigate**, **EG5016 Explore** and **EG6026 Apply** within the discipline context where at Level 4 these are linked to the Learning to Learn where students identify their learning targets from Induction to graduation; beyond the discipline at Level 5 which includes an inter-departmental team design project; beyond the university at Level 6 which is to foster a bridge to the wider professional communities of practice for the student's subject discipline.

F. 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
- Annual Monitoring and Enhancement

- Continuous Monitoring of courses through the Kingston Course Enhancement Programme (KCEP+)
- Student evaluation including Student Voice Committees, Early Module Reviews (EMR), Module Evaluation Questionnaires (MEQs) and the National Student Survey (NSS)
- Moderation policies and procedures
- Feedback from employers (varying forms including IAB)
- Quality is also assured by the requirement for professional body (JBM) reaccreditation, generally at a five-year interval. Annual monitoring and periodic reviews by professional bodies (i.e., JBM) provide other opportunities for reflection and external contribution to course design, quality assurance and enhancement.

G. Employability and work-based learning

This curriculum is designed so that it embeds the development of employability skills throughout the course and equips students with the ability to relate the knowledge and skills that they have learnt to real world contexts in which they may work in the future.
Initially students 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 Careers and Employability Service, 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 tests and using LinkedIn-Learning modules (an active list is prepared and updated by a library and learning resources specialist). Student's development and career options are discussed in personal tutor meetings and guidance given as appropriate. This is in liaison with the University's Careers and Employability Service team.
The student's development of Future skills and Graduate Attribute is supported through active engagement in the KU Navigate Programme enabling students to understand and develop a design thinking approach to Future Skills development.
The Careers and Employability Service supports students in preparation of CVs and letters of application. Furthermore, the Careers and Employability Service arranges career fairs from leading employers (two or three times a year) who talk to students about work in the construction industry and skills required. With these visitors, students have the opportunity to have mock and/or real interviews as well collect information that helps them in career decision making.
The School strongly encourages and supports all students in applying for positions in industry for an Industrial Placement year between level 5 and level 6: the school emphasises the benefits to be obtained from an approved placement in industry. The school has a longstanding and active Industrial Advisory Board (IAB) which meets twice per year. The IAB is comprised of senior executives from leading client, contracting and consulting organisations. It provides useful input in the design/redesign of courses and units, which ensures that the course continues to meet the expectations of the construction industry. Furthermore, all academic staff are professionally engaged with many and varied links with the construction industry and

professional bodies. The school has therefore extensive contacts in the construction industry, and this usually improves students' chances of getting a placement.

Development of employability skills throughout the course

The progressive development of a range key employability skills is another feature of the course as exemplified in teamwork/group work discussed above. Regarding communication skills, at level 4 the focus is on writing individual practical reports (CE4011 Fluid and Soil Mechanics) using a standard format and style and encouraging students to orally communicate the outcomes of small group exercises in the active learning teaching sessions in (CE4023 Engineering Design) and (CE4025 Mechanics and Materials). To help development of these skills' student will be required to submit a draft of a report for (CE4025 Introduction to Mechanics & Materials) to the School Academic Success Centre (SASC) for feedback and to discuss this with their personal tutor. The module (CE4021 Navigate for the Professional Engineer) which is closely linked to the personal tutor scheme and it introduces key academic and employability skills. In addition, it focuses on reflective practice on feedback on their progress with academic and employability skills.

At level 5 students will be required to participate in a substantial multi-disciplinary group project on sustainability and present their individual findings in (EG5016 Explore). This module aims to assist students in reflecting on the skills that they are developing and consider how they relate to employability. In many other modules i.e., CE5021, CE5023 and CE5024, students are required to produce individual/group laboratory reports on more challenging topics.

Employability skills continue to be enhanced at level 6 with the module (EG6026 Apply) where entrepreneurship is addressed using KU Bright Ideas competition as well as encouraging students to reflect on the employability skills they have developed and be proactive in moving towards a professional life and/or further study. With modules (CE6027 & EG7XXX Design Project) where group design activities are at the centre of learning and CE6027/EG7XXX that also include lab reports, presentations and group discussions. The In the Individual Project module CE6025 students will be taught how to synthesise and critical review information from a variety of sources and report this and their research results in a formal research report and an oral presentation.

Civil Engineering students at Kingston are taught by qualified engineers with substantial personal experience of industry gained either prior to joining the University or through continuing consultancy practice. Industrial consultancy has a similar beneficial effect to research and scholarship, which together inform the teaching at all levels. The beneficial effects diffuse throughout the courses, ranging from the laboratories into such areas as the choice of locations and sites for visits and field courses, selection of case records for study and areas for project work as well as informing syllabus content, course design, as well as update of the content of individual lectures. The school has been an academic partner with the Institution of Civil Engineers for many years where students are introduced to the institute from induction and many times throughout their learning journey and are encouraged to join the ICE portal for recording and assessing the students' Initial Professional Development. This will help students' employability as they will be able to satisfy the ICE attributes through their studies and achieve their professional qualification soon after graduation.

This course has been designed to fully meet the exemplifying academic benchmark requirements, for Chartered Engineer (CEng) status. Most graduates will aspire to careers in the construction industry and to becoming chartered. Graduates develop careers in all branches of the Civil Engineering/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. Where students take an industrial placement, they are, in many instances, able to secure employment with the placement organisation following graduation. The academic and key skills developed throughout a course allow graduates to follow careers in other professions such as ICT, finance, teaching and as construction professionals.

Work-based learning, including sandwich courses and higher or degree apprenticeships

Work placements are actively encouraged – although it is the responsibility of individual students to source and secure such placements. University staff develop and promote relationships with industry and provide assistance to students in the process of finding a placement.

All students are encouraged to make use of the opportunity to enhance their learning and personal development by undertaking an industrial placement after the second year of their programme. All placements are reviewed to ensure that they provide a relevant experience in which students can apply their learning in a practical situation. Students have the responsibility for securing an industrial placement; placements are not guaranteed. All students on the course receive support from the placement specialists from the Careers and Employability Service in securing a position and while in the workplace. The Careers and Employability Services also organises employers' events for student recruitment.

An Industrial Placement comprises a period of at least 36 weeks with an approved employer. Students have a support network that includes assistance during the process from preparation of their curriculum vitae through applications and the interview/assessment to agreeing their contract. Students are required to produce quarterly reports on their placement and are supported throughout the period by their personal tutor, who will visit them at their place of work on at least one occasion. The personal tutor will discuss progress with the student and employer and will recommend any improvements to the learning opportunities, if appropriate. This allows students to reflect upon their own personal experience of working in an applied setting, to focus on aspects of this experience that they can clearly relate to theoretical concepts and to evaluate the relationship between theory and practice. Students fulfilling the requirements for an Industrial Placement will be awarded with a Professional Placement on the completion of level 7.

H. Other sources of information that you may wish to consult

Work placements are actively encouraged – although it is the responsibility of individual students to source and secure such placements. University staff develop

and promote relationships with industry and provide assistance to students in the process of finding a placement.

All students are encouraged to make use of the opportunity to enhance their learning and personal development by undertaking an industrial placement after the second year of their programme. All placements are reviewed to ensure that they provide a relevant experience in which students can apply their learning in a practical situation. Students have the responsibility for securing an industrial placement; placements are not guaranteed. All students on the course receive support from the placement specialists from the Careers and Employability Service in securing a position and while in the workplace. The Careers and Employability Services also organises employers' events for student recruitment.

An Industrial Placement comprises a period of at least 36 weeks with an approved employer. Students have a support network that includes assistance during the process from preparation of their curriculum vitae through applications and the interview/assessment to agreeing their contract. Students are required to produce quarterly reports on their placement and are supported throughout the period by their personal tutor, who will visit them at their place of work on at least one occasion. The personal tutor will discuss progress with the student and employer and will recommend any improvements to the learning opportunities, if appropriate. This allows students to reflect upon their own personal experience of working in an applied setting, to focus on aspects of this experience that they can clearly relate to theoretical concepts and to evaluate the relationship between theory and practice. Students fulfilling the requirements for an Industrial Placement will be awarded with a Professional Placement on the completion of level 7.

I. Development of Course Learning Outcomes in Modules

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

Module Code		Level 4						Level 5						Level 6								Level 7							
		CE4021	CE4011	CE4024	CE4023	EG4022	CE4025	CE5020	CE5023	CE5024	CE5021	CE5022	CE5034	CE6026	EG6026	CE6027	CE6021	CE6023	CE6022	CE6024	CE6020	CE7729	CE7701	CE7011	EG7000	CE7720	CE7723	CE7728	CE7721
Knowledge & Understanding	A1																					S	S	S	S				S
	A2																					S			S				S

	A3																								S				
	A4																					S	S						
	A5																				S			S				S
	A6																					S	S						
Intellectual Skills	B1																				S	S	S	S				S
	B2																					S	S		S				
	B3																					S	S		S				
	B4																					S	S						
	B5																					S	S						
	B6																					S	S						
Practical Skills	C1																								S			S	
	C2																								S				
	C3																								S				
	C4																								S			S	
	C5																					S						S	
	C6																					S						S	

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