

Template C4



Programme Specification

Title of Course: *BEng (Hons) Mechanical Engineering*

Date first produced	30/06/2017
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Version number	17
Faculty	Faculty of Engineering, Computing and the Environment
Cross-disciplinary	
School	School of Engineering
Department	Department of Mechanical Engineering
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):	BEng (Hons) Mechanical Engineering
Exit Award(s) and Title(s):	Cert HE in Mechanical Engineering Dip HE in Mechanical Engineering Ordinary degree
Course Code <i>For each pathway and mode of delivery</i>	UFMEE1MEE20
UCAS code <i>For each pathway</i>	

Award(s) and Title(s):	BEng (Hons) Mechanical Engineering with Professional Placement
Exit Award(s) and Title(s):	Cert HE in Mechanical Engineering Dip HE in Mechanical Engineering Ordinary degree
Course Code <i>For each pathway and mode of delivery</i>	USMEE1MEE45
UCAS code <i>For each pathway</i>	

Award(s) and Title(s):	BEng (Hons) Mechanical Engineering with Foundation Year
Exit Award(s) and Title(s):	Cert HE in Mechanical Engineering Dip HE in Mechanical Engineering Ordinary degree
Course Code <i>For each pathway and mode of delivery</i>	MFME1MEE55
UCAS code <i>For each pathway</i>	

Award(s) and Title(s):	BEng (Hons) Mechanical Engineering (Automotive Engineering)
Exit Award(s) and Title(s):	Cert HE in Mechanical Engineering (Automotive Engineering) Dip HE in Mechanical Engineering (Automotive Engineering)

	Ordinary degree
Course Code <i>For each pathway and mode of delivery</i>	UFMEA1MEA20
UCAS code <i>For each pathway</i>	

Award(s) and Title(s):	BEng (Hons) Mechanical Engineering (Automotive Engineering) with Professional Placement
Exit Award(s) and Title(s):	Cert HE in Mechanical Engineering (Automotive Engineering) Dip HE in Mechanical Engineering (Automotive Engineering) Ordinary degree
Course Code <i>For each pathway and mode of delivery</i>	USMEA1MEA45
UCAS code <i>For each pathway</i>	

Award(s) and Title(s):	BEng (Hons) Mechanical Engineering (Automotive Engineering) with Foundation Year
Exit Award(s) and Title(s):	Cert HE in Mechanical Engineering (Automotive Engineering) Dip HE in Mechanical Engineering (Automotive Engineering) Ordinary degree
Course Code <i>For each pathway and mode of delivery</i>	UFMEA1MEA55
UCAS code <i>For each pathway</i>	

Award(s) and Title(s):	BEng (Hons) Mechanical Engineering with Foundation Year and Professional Placement
Exit Award(s) and Title(s):	CertHE DipHE Ordinary Degree
Course Code <i>For each pathway and mode of delivery</i>	USMEE1MEE56
UCAS code	

<i>For each pathway</i>	
Award(s) and Title(s):	BEng (Hons) Mechanical Engineering (Automotive Engineering) with Foundation Year and Professional Placement
Exit Award(s) and Title(s):	CertHE DipHE Ordinary Degree
Course Code <i>For each pathway and mode of delivery</i>	USMEA1MEA56
UCAS code <i>For each pathway</i>	

Awarding Institution:	Kingston University
Teaching Institution:	Kingston University
Location:	Roehampton Vale Campus, Kingston
Language of Delivery:	English
Delivery mode:	Primarily campus based (up to 20% of scheduled L&T hours delivered online)
Learning mode(s):	Full-time With Professional Placement With foundation year
Minimum period of registration:	Full-time - 3 With Professional Placement - 4 With foundation year - 4
Maximum period of registration:	Full-time - 6 With Professional Placement - 8 With foundation year - 8
Entry requirements	Kingston University typically uses a range of entry requirements to assess an applicant's suitability for our courses. Most course requirements are based on UCAS Tariff points, usually stipulated as a range, and are sometimes coupled with minimum grades in specific relevant subjects. We may also use interview, portfolio and performance pieces to assess an applicant's suitability for the course. We recognise that every person's journey to Higher Education is different and unique and in some cases we may take into account work experience and other non-standard pathways onto University level study.

	<p>Additionally, all non-UK applicants must meet our English language requirements.</p> <p>Please see our course pages on the Kingston University website for the most up to date entry requirements</p>
Regulated by	The University and its courses are regulated by the Office for Students.
Programme Accredited by:	<p>Institution of Mechanical Engineers (IMechE):</p> <ul style="list-style-type: none"> · EngC ref. 1309: BEng (Hons) Mechanical Engineering · EngC ref. 16900: BEng (Hons) Mechanical Engineering with Professional Placement · EngC ref. 16902: BEng (Hons) Mechanical Engineering (Automotive Engineering) · EngC ref. 16903: BEng (Hons) Mechanical Engineering (Automotive Engineering) with Professional Placement
Approved Variants:	<p>Where a module has more than one element of assessment, in addition to the normal requirement that a student must pass the module on aggregate, there are additional requirements for the student to pass elements of assessment in the module separately in order to achieve an overall pass for the module. Such additional module-specific requirements are outlined in the Module Descriptors.</p> <p>· To comply with the Engineering Council regulations, a maximum of 30 credits in the programme can be compensated.</p>
Is this Higher or Degree Apprenticeship course?	No

SECTION 2: THE COURSE

A. Aims of the Course

The general aim of the Mechanical Engineering course, including the Automotive Engineering pathway, is to equip graduates with the engineering, design, management, business and personal skills required to become professional mechanical/automotive engineers, as well as enabling them to follow careers in related professional disciplines.

More specific aims of the course are:

- To develop students' analytical and problem-solving abilities, enabling them to evaluate evidence and assumptions critically, make informed decisions, and communicate their findings effectively.
- To equip students with the research skills required for postgraduate studies and the employability skills essential for work in mechanical engineering and related industries.
- To produce graduates with an in-depth knowledge and understanding of the key aspects of mechanical/automotive engineering.
- To prepare graduates to approach design problems creatively and to possess the technical skills necessary to realise these solutions.
- To furnish graduates with a comprehensive understanding of sustainability and health and safety principles within the context of their discipline.
- To provide graduates with reflective skills to recognise the importance of continuous self-development in applying their professional judgment.
- To ensure that graduates possess the ability and confidence to assume leadership roles in major engineering projects.
- To provide students with multidisciplinary skills and knowledge by offering common modules throughout the programme.
- To furnish students with the leadership skills and knowledge required to generate new knowledge through research and development, as required for chartered engineers.

B. Programme Learning Outcomes

The programme learning outcomes are the high-level learning outcomes that will have been achieved by all students receiving this award. They have been aligned to the levels set out in '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
A7	Develop a critical awareness of new developments in the field of mechanical engineering and their potential impact on industry and society	B6	Use a risk management process to identify, evaluate and mitigate risks associated with mechanical engineering projects or activities	C5	Function effectively as an individual, and as a member or leader of a team, evaluating the effectiveness of own and team performance
A6	Evaluate the environmental impact of mechanical systems and design solutions that minimise adverse impacts	B5	Identify and analyse ethical concerns related to mechanical engineering projects and make reasoned ethical choices informed by professional codes of conduct	C4	Develop practical skills to prototype and test mechanical systems, ensuring their effectiveness, reliability and safety
A5	Demonstrate knowledge of manufacturing processes and materials selection, recognising their limitations	B4	Design mechanical systems that meet desired specifications and constraints, while considering factors such as safety, reliability and cost	C3	Design and conduct experiments to validate and optimise mechanical systems and components, interpreting and presenting data in a clear and concise manner
A4	Apply knowledge of thermodynamics and fluid mechanics to analyse and design thermal and fluid systems	B2	Select and apply appropriate computational and analytical techniques to model mechanical systems and processes, discussing the limitations of the techniques employed	C2	Select and apply appropriate materials, equipment, engineering technologies and processes for manufacturing and assembling mechanical components and systems, recognising their limitations

A2	Identify and apply engineering concepts in design, analysis and optimisation of mechanical systems	B1	Formulate and analyse complex mechanical engineering problems to reach substantiated conclusions	C1	Use practical laboratory and workshop skills to investigate and test mechanical systems and components
A1	Apply a comprehensive knowledge of core mechanical engineering subjects of statics, dynamics, materials, thermodynamics, fluid mechanics and design to the solution of complex problems in mechanical engineering	B3	Select and critically evaluate technical literature and other sources of information to solve mechanical engineering problems	C6	Communicate effectively on mechanical engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used
A3	Develop an understanding of the mechanical behaviour of materials and apply this knowledge to the design of components and structures	B7	Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity, and inclusion in mechanical engineering projects and activities.	C7	Adopt a holistic and proportionate approach to the mitigation of security risks associated with mechanical engineering projects and activities

C. Future Skills Graduate Attributes

In addition to the programme learning outcomes, the programme of study defined in this programme specification will engage students in developing their Future Skills 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

D. Outline Programme Structure

The undergraduate mechanical engineering programme at Kingston University consists of four main themes, each of which is designed to provide a comprehensive understanding of mechanical/automotive engineering principles and practices. The first theme is focused on developing a deep understanding of the principles of engineering science such as thermodynamics, mechanics of solid and materials and fluid mechanics, which are essential for solving complex engineering problems related to the behaviour of materials and mechanical systems. The second theme aims to broaden students' knowledge base by introducing them to topics such as electrical and electronic systems, engineering mathematics, programming and computing. The third theme is dedicated to introducing students to the professional practice of mechanical/automotive engineering, covering topics such as project management, quality assurance, and business management. Finally, the programme incorporates a strong design theme that is woven throughout all the other themes, emphasising the holistic nature of modern-day engineering. By developing skills in materials, manufacturing processes, communication, and problem-solving, students will be well-equipped to meet the needs of the future workforce.

Our programme design is based on the guidelines provided by the Engineering Council UK Standard for Professional Engineering Competence (UK-SPEC), the Quality Assurance Agency (QAA) Subject Benchmark Statement for Engineering, and the Institution of Mechanical Engineers (IMechE) Academic Accreditation.

Our Mechanical Engineering degrees have been accredited by the IMechE. This accreditation signifies that our programmes adhere to the highest standards of education and provide a clear pathway towards achieving Chartered Engineer status. The BEng (Hons) will meet, in part, the exemplifying academic benchmark requirements for registration as a Chartered Engineer. Students will need to complete an approved format of further learning pursuant to the requirements of the UK-SPEC. The BEng (Hons) will also automatically meet the exemplifying academic benchmark requirements for registration as an Incorporated Engineer (IEng). The

University provides students with relevant regulations and specific requirements for accreditation by external professional or statutory bodies.

An Engineering Foundation course in mechanical engineering is available for students who need a preparatory period of study. This alternative entry route accommodates students who may not meet our standard entry requirements but possess the potential to thrive in a degree-level programme.

To complete their degree, students are typically required to complete 120 credits at each level. During their first year (also known as Level 4), both mechanical engineering and automotive engineering pathway students will take a set of six modules, consisting of four 15-credit modules and two 30-credit modules. Table below provides an overview of the programme's structure. Full details of each module will be provided in individual Module Descriptors and student Module Guides. The list of modules provided below is only indicative and may include both core and optional modules.

BEng (Hons) Mechanical Engineering

Level 4							
BEng (Hons) Mechanical Engineering							
Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Engineering Design and Manufacturing	ME4016	30	4	TY13		1	
Engineering Mathematics	EG4017	15	4	TB1		1	
Engineering Mechanics and Materials	ME4015	30	4	TY13		1	
Navigate for the Professional Engineer	ME4021	15	4	TB1		1	
Programming for Engineers	EG4016	15	4	2		1	1
Thermodynamics and Fluid Mechanics	ME4014	15	4	TB2		1	
Optional Modules							
Formula Student Fundamentals	ME4222	0	4	TY13		1	

Exit Awards at Level 4

The programme 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 either Mechanical Engineering or Mechanical Engineering (Automotive Engineering), depending on their chosen programme of study.

Level 5							
BEng (Hons) Mechanical Engineering							
Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Computer-Aided Engineering	ME5018	30	5	Year Long		2	2
Electronic and Control Systems	ME5017	30	5	Year Long		2	
Exploring Engineering Project Management	EG5016	15	5	TB2		2	
Numerical Analysis and Computing	EG5015	15	5	TB1		2	
Solid Mechanics and Vibration	ME5016	15	5	TB1		2	2
Thermofluids	ME5015	15	5	TB2		2	2
Optional Modules							
Industrial Placement	ME5023	120	5	Year Long		3	

Exit Awards at Level 5

Progression to Level 6 requires passes in all four modules to give 120 credits at Level 5. 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 either Mechanical Engineering or Mechanical Engineering (Automotive Engineering), depending on their programmes of study.

Level 6							
BEng (Hons) Mechanical Engineering							

Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Applied Business Management	EG6026	15	6	TB1		3	
Dynamics and Control	EG6027	15	6	2		3	3
Fluid Dynamics and Thermal Systems	ME6018	15	6	2		3	3
Individual Project	ME6020	30	6	TY13		3	
Machine Design with Finite Element Method	ME6019	30	6	1 & 2		3	3
Microcontrollers	ME6017	15	6	1		3	3

Exit Awards at Level 6

Progression to Level 6 requires passes in all four modules to give 120 credits at Level 5. 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 either Mechanical Engineering or Mechanical Engineering (Automotive Engineering), depending on their programmes of study.

BEng (Hons) Mechanical Engineering with Professional Placement

BEng (Hons) Mechanical Engineering with Foundation Year

BEng (Hons) Mechanical Engineering (Automotive Engineering)

Level 4							
BEng (Hons) Mechanical Engineering (Automotive Engineering)							
Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Engineering Design and Manufacturing	ME4016	30	4	TY13		1	
Engineering Mathematics	EG4017	15	4	TB1		1	
Engineering Mechanics and Materials	ME4015	30	4	TY13		1	

Navigate for the Professional Engineer	ME4021	15	4	TB1		1	
Programming for Engineers	EG4016	15	4	TB2		1	1
Thermodynamics and Fluid Mechanics	ME4014	15	4	TB2		1	
Optional Modules							
Formula Student Fundamentals	ME4222	0	4	TY13		1	

Exit Awards at Level 4

The programme 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 either Mechanical Engineering or Mechanical Engineering (Automotive Engineering), depending on their chosen programme of study.

Level 5							
BEng (Hons) Mechanical Engineering (Automotive Engineering)							
Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Automotive Design Team Project	ME5022	30	5	Year Long		2	2
Automotive Powertrain Systems	ME5020	15	5	TB2		2	2
Electronic and Control Systems	ME5017	30	5	Year Long		2	
Exploring Engineering Project Management	EG5016	15	5	TB1		2	
Numerical Analysis and Computing	EG5015	15	5	TB1		2	
Vehicle Dynamics and Suspension	ME5019	15	5	TB2		2	2

Optional Modules							
Industrial Placement	ME5023	120	5	Year Long		3	

Exit Awards at Level 5

This programme 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 and must be passed before consideration for an award or progression to level 7 (if applicable). 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 either Mechanical Engineering or Mechanical Engineering (Automotive Engineering), depending on their chosen programme of study.

Level 6							
BEng (Hons) Mechanical Engineering (Automotive Engineering)							
Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Applied Business Management	EG6026	15	6	TB1		3	
Automotive Design and Structural Analysis	ME6023	15	6	TB2		3	3
High Performance Vehicle Aerodynamics	ME6022	15	6	TB2		3	3
Individual Project	ME6020	30	6	Year Long		3	
Machine Design with Finite Element Method	ME6019	30	6	Year long		3	3
Microcontrollers	ME6017	15	6	TB1		3	

Exit Awards at Level 6

[BEng \(Hons\) Mechanical Engineering \(Automotive Engineering\) with Professional Placement](#)

Level 5

BEng (Hons) Mechanical Engineering (Automotive Engineering) with Professional Placement							
Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Industrial Placement	ME5023	120	5	TY13		3	

Exit Awards at Level 5

This programme 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 and must be passed before consideration for an award or progression to level 7 (if applicable). 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 either Mechanical Engineering or Mechanical Engineering (Automotive Engineering), depending on their chosen programme of study

[BEng \(Hons\) Mechanical Engineering \(Automotive Engineering\) with Foundation Year](#)

[BEng \(Hons\) Mechanical Engineering with Foundation Year and Professional Placement](#)

Level 5							
BEng (Hons) Mechanical Engineering with Foundation Year and Professional Placement							
Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Industrial Placement	ME5023	120	5	TY13		3	

Exit Awards at Level 5

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.

[BEng \(Hons\) Mechanical Engineering \(Automotive Engineering\) with Foundation Year and Professional Placement](#)

Level 5							
BEng (Hons) Mechanical Engineering (Automotive Engineering) with Foundation Year and Professional Placement							

Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Industrial Placement	ME5023	120	5	TY13		3	

Exit Awards at Level 5

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.

E. Teaching, Learning and Assessment

The undergraduate mechanical engineering programme has been crafted with Kingston University's Curriculum Design Principles in mind, to cultivate graduates who are not only proficient in their field but also possess a range of valuable qualities such as professionalism, creativity, resilience, proactivity, global awareness, independence, and the ability to learn continuously throughout their lives. By incorporating sustainability into its activities, the programme aims to help prepare graduates to address the pressing environmental and social challenges of our time. The key United Nations Sustainable Development Goals that the programme contributes to include:



Goal 7: Affordable and Clean Energy



Goal 9: Industry, Innovation and Infrastructure



Goal 12: Responsible Consumption and Production

We believe that every student's learning experience is unique, and we strive to provide an inclusive curriculum that acknowledges and accommodates students' circumstances. Our Navigate programme, which is integrated into each year of our courses and aligned with Kingston University's Future Skills Student Journey, aims to cultivate the essential communication, problem-solving, and creative thinking skills that employers highly value.

At Level 4 of the programme, students will establish a strong foundation in mathematics, physics, thermodynamics, fluid mechanics, mechanics of solid and materials, electronics, programming, and engineering design and manufacture, enabling students to understand the fundamental principles of mechanical

engineering. Level 5 of the programme builds on fundamental knowledge and skills acquired at Level 4, focusing on engineering principles underlying mechanical/automotive technologies. At Level 5, students will learn essential mathematical skills and knowledge required for analysing and solving equations, as well as handling complex data to improve efficiency and optimise processes. Workshops and laboratories such as the wind tunnel enhance students' learning experiences through active learning techniques, encouraging students to develop curiosity and a desire to learn for life. In addition, students will be introduced to the principles and commercial practices for managing engineering projects and related business operations in the context of time, quality, risk and sustainability aspects, which provides insight into the legal, commercial, social and ethical framework of engineering environments.

Through team-based design activities and industrially-based projects, students will have ample opportunities to enhance their communication skills and develop their ability to work collaboratively. The Automotive Engineering pathway curriculum is designed to provide a comprehensive understanding of the design and analysis of automotive systems. It covers various topics such as the selection of materials and processes used in manufacturing automotive components and emerging electric, hybrid and alternative fuel vehicle technologies. The modules are structured to equip students with the skills and knowledge required to excel in the automotive industry.

At Level 6 of the programme, the mechanical/automotive theme is taken to the next level by placing a strong emphasis on the development of essential professional and leadership skills and management abilities in a collaborative group setting, where sustainability and ethics are woven into the fabric of the project, as well as fostering independent learning. The programme aims to build on the knowledge acquired in previous levels and provide a deeper understanding of mechanical/automotive engineering, covering topics such as the design and analysis of machine elements, fluid dynamics and microcontrollers. For students following the Automotive Engineering pathway, the programme also includes an exploration of high-performance vehicle aerodynamics.

By the end of Level 6, students should have acquired the skills and knowledge necessary to operate effectively in the professional world of mechanical/automotive engineering, as well as the ability to adapt to changing technologies and practices. The Individual Project module is a culmination of the technical and academic aspects of the programme, offering students a unique opportunity to apply the knowledge and skills they have acquired during the course in a capstone project. This module challenges students to achieve agreed deliverables, while honing their research skills and using technical literature to inform their work. Through this experience, students will gain valuable practical experience and demonstrate their ability to synthesise complex information and apply it to real-world problems.

A Personal Tutorial System is seamlessly incorporated into the curriculum, offering a structured platform for regular and discipline-specific small-group discussions and debates. Scheduled tutorial sessions are dedicated to reinforcing the core themes and practices of the programme, thereby enhancing the understanding and application of key concepts. These sessions serve as a valuable opportunity for

students to deepen their knowledge, engage in thoughtful discussion, and clarify any uncertainties within the context of the curriculum.

Research-informed teaching

Most of the module teams are engaged in engineering research or industry-related professional activities, such as Knowledge Transfer Partnerships (KTPs), which have significantly influenced the design and content of the programme. The Department's Industrial Advisory Board also provides valuable input from industry, further informing the programme's development.

The academic staff are committed to continuous professional development in teaching and learning in higher education and wider pedagogic issues. Their research and development of innovative ideas informs the curriculum and enhances student learning experience both within and outside the classroom. As part of their pedagogic research, the staff has developed computing resources in fundamental subjects such as mathematics and mechanics, which are embedded in the Virtual Learning Environment (VLE) system. Furthermore, an electronic voting system has been adopted for summative and formative assessments, as an example of the staff's commitment to pedagogic research. This reflective and evidence-based approach to teaching serves as a model for students to follow in their future professional practice.

Interdisciplinary collaboration

The Navigate for the Professional Engineer, Exploring Engineering Project Management and Applied Business Management modules are shared with students from various disciplines beyond mechanical and automotive engineering. This approach provides valuable experience for the students in working collaboratively across interdisciplinary teams, which is highly valued by many industries as an essential employability skill. The first year Navigate for the Professional Engineer module involves a team-based activity whereby the students are tasked to solve a design thinking challenge. In the second year Exploring Engineering Project Management module, students continue to develop their interdisciplinary teamwork skills and learn about team project management while working on a more complex challenge. Finally, in the third year Applied Business Management module, students consolidate their teamworking skills by undertaking a team-based design project within their own engineering discipline, building on the teamworking skills they have developed in earlier years.

Hands-on practical work

Hands-on practical experience in workshops and laboratories is crucial for developing practical skills and enhancing data collection and analysis abilities. Our curriculum includes practical work closely related to the theoretical content to provide context and reinforce learning. At Level 4, students learn basic measurement and manufacturing processes and apply them in laboratory and testing environments. At Level 5, the focus is on measuring a variety of parameters, with supervised practical sessions that follow experimental protocols. At Level 6, students are expected to select and apply requisite practical skills in their own independent research. Our

Automotive Engineering students learn to analyse, research and design road vehicles. Both Mechanical Engineering and Automotive Engineering pathway students complete an extensive team project, applying their knowledge to a real-world and integrated industrially-based problem.

Development of independent learning through the programme

The learning, teaching and assessment strategy of the programme is designed to facilitate students' progression in both curriculum content and skill development as they advance through the different levels of study. At Level 4, students receive comprehensive guidance and structured learning that focuses on acquiring essential engineering knowledge and skills (e.g., mathematics, programming, IT and practical skills) while also facilitating the development of key employability skills (e.g., transferrable skills). These provide a strong basis for students to undertake deeper study in a particular engineering field at Level 5. At this stage, students will be expected to engage in independent learning, with less emphasis on traditional lectures. As they progress to Level 6, students will assume greater responsibility for their independent study, while academic staff will play a supervisory role. This is particularly evident in the individual and team project modules.

The Module Guides provide clear expectations for students to engage in guided independent learning. At Level 4, students will be directed to utilise Technology Enhanced Learning (TEL) packages to prepare for individual topics or sessions, and to complete problem sets or exercises to consolidate and test their understanding. The VLE at Kingston offers a wide range of TEL resources, including videos, screencasts, online multiple-choice questions (MCQs), discussion boards and interactive teaching packages, to support learning throughout the programme. Additionally, the VLE delivers lecture notes/presentations, problem sets, and worked examples. This inclusive approach allows students to access learning material at their convenience, work through it at their own pace and have the flexibility to pause and rewind as needed.

Assessment for learning

The assessment tasks are designed to be authentic, engaging and transparent, focusing on real-world engineering activities that improve students' employability. The programme employs a variety of assessment methods, including portfolios, quizzes, online tests, in-class tests, practical exercises, tutorial questions and end-of-module examinations. Additionally, all modules have explicit formative assessments to provide opportunities for practice and "feed forward" to help students improve their work for subsequent summative assessments. While examinations remain an effective way to assess basic knowledge and understanding, the strategy recognises that other assessment methods can also be well-suited to assess higher-level problem-solving skills. A well-balanced range of assessment methods is a key part of our inclusive assessment strategy, with group and teamwork assessment playing an instrumental role in developing and recognising this essential employability skill.

The programme employs various components to assess the modules including practical exercises to evaluate students' technical competence and understanding;

individual and group-based project work to assess the ability to provide solutions to realistic problems, work effectively in a team, and communicate effectively through written reports, oral presentations or video. Multiple choice or short answer questions are also used to evaluate basic techniques and understanding of concepts, while long answer structured questions in coursework assignments and end-of-module examinations assess the ability to apply learned techniques and provide accurate solutions within a restricted time; the individual project module to assess the ability to plan work, manage time effectively and research background information, culminating in a written report and interview; and finally, individual and group laboratory reports are used to evaluate students' technical competence and ability to work effectively in a laboratory setting.

Inclusive teaching practice

The University is committed to an inclusive curriculum, encouraging students to consider themselves as members of a professional community. The Student Voice Committee provides a platform for students to voice their opinions and suggest improvements for developing a more inclusive curriculum that takes into account the specific circumstances of the student body. To cater to different learning preferences and experiences, a diverse range of teaching activities is provided with a careful balance between individual and group-based activities. The assessment brief, provided at the beginning of the year, includes marking criteria for all assessments. The language used in the criteria is clear and concise to ensure that students understand the expectations. Additionally, in-class discussions are held to allow students to question and clarify any doubts regarding the marking criteria.

Focus on active learning and enhancing student engagement

The programme emphasises on active learning through collaborative, problem-solving and enquiry-based workshops and tutorials. Engaging sessions require students to prepare beforehand and actively participate during the class, as opposed to passively listening to lectures. Furthermore, the guided learning approach encourages students to consolidate their knowledge after the session. Additionally, students can benefit from opportunities for peer learning, group work and presentation practice. In these interactive sessions, the lecturer plays a crucial role in supporting students to construct their own knowledge and understanding while introducing and summarising key concepts through short mini lectures.

Active and collaborative learning techniques are utilised in the lectures, which may include interactive presentation software, question-and-answer sessions and brief student discussions integrated into the lecture. By incorporating these methods, valuable contact time is spent on applying and critically analysing knowledge, while also developing key skills such as problem-solving, communication and teamwork. To further promote student engagement and sense of belonging, the programme offers various opportunities for students to interact with staff and peers, including through the personal tutorial scheme (PTS), field work, industrial visits, extra-curricular seminars, research internships, course representative system, student ambassador work, peer mentoring and outreach initiatives, as well as hands-on activities such as IMechE Design Challenge, Formula Student, TT-Bike racing, and Robotics Club. These efforts also support improved retention and progression

among students and enhance student engagement, creativity, confidence and self-reliance.

Development of employability skills

The programme not only focuses on imparting theoretical knowledge but also aims to develop a wide range of essential employability skills. This is achieved by embedding future-oriented skills throughout the curriculum via a personalised development programme called Navigate. Through the Navigate programme, students are equipped with effective communication, problem-solving and creative thinking skills – qualities that employers seek in graduates. The programme spans three years, with the first year being dedicated to understanding and reflection on the Kingston Graduate Attributes. The integration of ‘Skills for Innovation’ across both business and higher education domains ensures that graduates have the skills, experience and opportunities required to excel in their chosen careers.

Throughout all levels of the programme, students are encouraged to develop their research skills, which are a fundamental part of the curriculum. Through project work, they can collaborate with research-active staff on live projects. These experiences enable students to determine, distinguish and present appropriate evidence in an argument, which is highly valued by employers. Developing research skills is an essential component of the programme and will equip students with the necessary tools to conduct independent research and contribute to the field of mechanical/automotive engineering. By honing their research skills, students will be better equipped to solve complex problems, evaluate data and make informed decisions in their professional careers.

Employability criteria identified using feedback from employers, alumni, Industrial Advisory Board, and the Institution of Mechanical Engineers (IMechE) are embedded in the curriculum. Each module is examined to determine opportunities to incorporate employability skills. The University’s academic and Careers and Employability Service teams identify appropriate provisions and tailor opportunities to bridge gaps.

The IMechE Design Challenge, integrated into the course curriculum, fosters a pragmatic learning approach by challenging students to apply their acquired knowledge to practical and real-world engineering problems. From the conception to the construction and operation of a device within set technical parameters, students experience the full lifecycle of an engineering project. Not only does this develop technical competencies, but also cultivates valuable transferrable skills such as budgeting, public speaking and teamwork. It enables students to encounter and overcome challenges as they arise, instilling resilience, adaptability and innovation. Progressing through internal, regional and potentially national levels of the competition opens up numerous networking opportunities with potential employers and industry professionals.

The IMechE Formula Student competition, on the other hand, serves as an integral component of the curriculum, equipping students with a well-rounded skill set that extends beyond academic learning and prepares them for the demands of the professional world. Students are required to design and manufacture a prototype of a single-seat race car. This demanding task enables students to refine their technical

skills and deepen their understanding of engineering design and manufacturing processes. Moreover, the competition goes beyond developing technical expertise. It provides a platform for students to cultivate essential skills like teamwork, time management, project management, budgeting, and presentation. These competencies, highly sought-after by employers, can significantly enhance students' employability prospects.

To complement the development of employability skills in the curriculum, personal tutors enhance student engagement with employability opportunities by highlighting them within their sessions and encouraging students to participate in a variety of extracurricular activities. These activities may include student representation, part-time work, sports and recreation, society memberships, volunteering, student ambassadorship, leadership and mentoring, cultural and creative activities, academic and professional collaborations, placement opportunities, enterprise activities and events hosted by the University's Careers and Employability Service. The University's Kingston Award Scheme recognises participation in these areas.

Additionally, the Careers and Employability Service hosts a range of events, such as career fairs where employers promote internship, placement and graduate opportunities, as well as networking activities like spotlight on engineering, which invites employers and alumni to discuss career pathways on campus. Students develop a CPD record in the VLE to utilise for job applications and interviews. For students pursuing the "with professional placement" degree on the sandwich route, the placement module (CI5999) is a crucial aspect of the programme. This module provides an extended opportunity to gain real-world employability skills in industry, making it a key element of the course. Moreover, the Careers and Employability Service offers support to students before and during their placement.

Placement year

Students are strongly encouraged to pursue an industrial placement between Levels 5 and 6 as it offers a valuable opportunity to enhance both their academic knowledge and personal growth. During the placement year, which lasts for at least 36 weeks and is conducted with an approved employer, students can apply their learning to practical situations that are relevant to their field of study. In addition to gaining work experience, students can reflect on their own personal development and evaluate the relationship between theory and practice. Students must maintain a comprehensive logbook documenting their activities and involvement in the company. At the end of their work period, students are expected to produce a final report that not only reflects on their experiences but also evaluates the organisational and business aspects of the company.

Students on courses with professional placement can register for the IMechE Monitored Professional Development Scheme (MPDS) scheme if they desire their placement year to be accredited by the IMechE. The MPDS scheme, adhering to the competencies outlined by the Engineering Council's UK Standard for Professional Engineering Competence (UK-SPEC), provides the students with a structured development framework. This facilitates their journey towards professional registration by enabling them to demonstrate their learning through the submission of reports to the IMechE. Furthermore, participation in the MPDS scheme counts as the

first year of industrial experience required for Chartership. Thus, the scheme not only aids students in their professional registration application but also acts as a catalyst for their career progression by speeding up their path towards Chartership.

Students will be supported throughout their placement by their placement tutor who will maintain contact with the students. During the placement, two visits from the placement tutor will take place to provide guidance and support. The primary objectives of these visits are to: support the student with the planning necessary to maximise success in their penultimate undergraduate year; encourage the student to reflect on the employability skills they have developed and be proactive in moving towards a professional life and/or further study; help the student 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.

The placement tutor will discuss the student's progress with both the student, their employer and the student's personal tutor (if different from their placement tutor) and recommend any necessary improvements to the learning opportunities. This approach ensures that students have a structured and supportive learning experience while gaining practical work experience in their field of study. The placement tutor's involvement provides students with valuable guidance and feedback, while the logbook and final report encourage students to reflect on their learning and apply academic concepts to real-world situations.

Historically, many sandwich placements offer reasonable remuneration. While the University's placement team provide support to students in securing a position, it is ultimately the student's responsibility to secure their own placement, and placements are not guaranteed.

F. Support for Students and their Learning

We are committed to helping our students succeed by providing tailored support and resources that meet their unique needs. Our personal tutor (PT) scheme plays a crucial role in delivering a personalised learning experience. For our Navigate for the Professional Engineer, Exploring Engineering Project Management and Applied Business Management modules at Levels 4, 5 and 6, respectively, we provide a core set of formative assessment problems that cover the curriculum. These problems enable students to test their learning and measure their progress. PTs use progress on these activities as a key discussion point during one-to-one meetings. To track their progress, students are required to upload their progress on these activities to their Learning Log, which is available to the relevant PTs. The PTs set milestones for students to meet at every level and monitor their progress, offering appropriate advice when needed. If students face difficulties, PTs can provide assistance or direct students to available support resources, such as peer mentoring schemes, Maths Aid and online resources. 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** to provide academic advice and guidance
- An **Academic Team** that seeks to maintain an open-door policy in the spirit of supporting students
- A **Student Support and Engagement Team** to help students with any problem that is affecting their studies
- A dedicated **Course Administrator**
- An **Induction programme** and study skills sessions at the start of each academic year
- **Student Academic Success Centre (SASC)**, 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 and note-taking to exam revision, referencing, programming and mathematical skills.
- **Virtual Learning Environment (VLE)**, a versatile on-line interactive intranet and learning environment accessible both on-site and remotely
- **Course Representative scheme**
- **University Careers and Employability Service**
- Comprehensive **University Support Systems** including the provision of advice on finance, regulations, legal matters, accommodation, international student support, disability and equality support
- The **Students' Union**

Personal Tutor Scheme (PTS)

PT meetings provide an opportunity for students to discuss their personal and professional development, as well as career options. During these meetings, students receive individualised guidance and support tailored to their specific needs and goals. The following outlines the overall aims of the PTS in our School:

- To build a rapport between staff and students and contribute to personalising students' experience within the School
- 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 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

PTs are allocated on a course basis during induction week. Student numbers are divided equally amongst the staff within the Department. Students will keep the same tutor throughout their course of study, except in cases where they change disciplines in their first year of study.

The PTS scheme is closely linked to the Navigate for the Professional Engineer, Exploring Engineering Project Management, and Applying Business Management modules, with specific aims and outcomes for each level. The scheme is progressive

and cumulative, with students building on the skills developed in previous levels. Formative assessment is provided through regular feedback during meetings. Personal tutorials offer opportunities for students to develop CV writing skills, discuss their skill sets, learn and revise techniques, explore employment opportunities, and identify extracurricular activities that align with their interests and goals.

Group tutorials provide a forum for students to discuss issues and brainstorm solutions to problems. Attendance at personal tutorials is recorded by tutors using the Online Student Information System (OSIS). The PTS Lead oversees the scheme in the School in conjunction with the Faculty PTS Lead. Regular reports on student attendance in personal tutorials are consulted to identify and provide support for struggling students.

Level 4: Settling in and building confidence

At Level 4, we provide students with a comprehensive list of engagement activities that complement the core set of problems assigned for each module. PTs regularly discuss with their tutees' progress on problem sets and participation in engagement activities throughout the academic year. PTs have access to the Learning Log, which facilitates further discussion during one-on-one meetings. To ensure that students stay on track, there are milestones to meet at every level, and PTs closely monitor their progress and provide relevant guidance and advice to help them succeed.

The aims of these activities are threefold: to assist students in making the transition to Higher Education and to generate a sense of belonging to the School and Department with an emphasis on widening participation issues; to help students to develop good academic habits and to gain the confidence to operate successfully in a university context; and to prepare students to make the most of feedback throughout their course.

The Navigate for the Professional Engineer module encourages students to engage in reflective practice and provides them with feedback on their progress towards acquiring essential skills. PT meetings will include discussions on these topics to ensure that students are adequately supported in their academic and professional development. PT meetings are scheduled throughout the academic year.

Level 5: Stepping it up and broadening horizons

At Level 5, students are expected to engage in reflection and evaluation of their skills acquisition and preparation for their industrial placement and future employment with the guidance of their PTs. This activity is integrated into the Explore module and aims to: help students comprehend and plan for the academic demands of Level 5 and to support increasing independence; encourage students to look forward, to take up opportunities to develop wider skills and to take responsibility for their personal development; foster students' ability to build on and respond proactively to the feedback they have received; and assist students in reflecting on the skills that they are developing and consider how they relate to employability.

Level 6: Maximising success and moving on

PTs will have access to all formative and summative assessment results of their tutees and will be responsible for discussing them with the students. They will assist the students in preparing plans for further improvement and advise on any academic issues they may have. Additionally, PTs are responsible for providing a comprehensive overview of the learning, teaching, learning outcomes and assessments, linking them to the student's progress.

G. Ensuring and Enhancing the Quality of the Course

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
- Education Committee with student representation
- Annual Monitoring and Enhancement
- Continuous Monitoring of courses through the Kingston Course Enhancement Programme (KCEP+)
- Student evaluation including Module Evaluation Questionnaires (MEQs), level surveys and the National Student Survey (NSS)
- Moderation policies
- Feedback from employers and alumni
- Industrial Advisory Board
- Professional body requirements

H. External Reference Points

External reference points which have informed the design of the course. These could include:

- PSRB standards
- QAA Subject benchmarks
- Apprenticeship standards
- Other subject or industry standards

I. Development of Course Learning Outcomes in Modules

This table maps where programme learning outcomes are **summatively** assessed across the **core** 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										
	EG4016	ME4016	ME4015	ME4014	ME4222	EG4017	ME4021	ME5020	ME5017	ME5019	ME5023	ME5022	EG5015	EG5016	ME5018	ME5015	ME5016	ME6017	ME6018	ME6019	ME6020	EG6027	EG6026	ME6022	ME6023
Knowledge & Understanding	A7																	S	S			S		S	
	A6						S							S					S	S					
	A5																		S						
	A4															S						S		S	
	A2															S	S	S	S	S		S		S	S
	A1	S														S	S	S	S			S	S	S	S
	A3																S								S
Intellectual Skills	E6																		S	S					
	E5																		S						
	E4																		S						
	E2																	S	S			S	S	S	S
	E1							S											S						S
	E3																S					S			
	E7													S											
Practical Skills	C5													S					S	S					
	C4							S											S						
	C3															S						S			S

C 2																		S	S						
C 1								S								S	S	S	S			S		S	S
C 6							S																		
C 7							S						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.

Additional Information