

**Programme Specification**

**Title of Course:** MEng Mechanical Engineering with industrial experience

 MEng Mechanical Engineering (Automotive Engineering) with industrial experience

**Date Specification Produced:** July 2017

**Date Specification Last Revised:** August 2017

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

*Examples of completed programme specifications can be found on the* [*KU Programme Specification Archive*](http://www.kingston.ac.uk/programme-specifications/)

**SECTION 1: GENERAL INFORMATION**

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| **Title:** | MEng Mechanical Engineering with industrial experience MEng Mechanical Engineering (Automotive Engineering) with industrial experience |
| **Awarding Institution:** | Kingston University |
| **Teaching Institution:** | Kingston University |
| **Location:** | Roehampton Vale Campus, Kingston |
| **Programme Accredited by:** |  |

**SECTION 2: THE PROGRAMME**

1. **Programme Introduction**

The distinctive feature of the MEng with industrial experience provision at Kingston University is that it provides a fast-track opportunity to obtain an MEng degree with a year-long industrial placement in four years rather than five years. During the one year placement, students will gain valuable real world, industrial experience and further develop their employability skills. During the industry placement students will be an employee of the company and a registered student. Students will be required to report on a substantial industrial individual project and take a business related work based learning module and a distance learning module. It is a student’s responsibility to secure an industrial placement; students will be supported in the search by employability consultants and talent preparation officers from KU Talent (employability service). If students are unsuccessful in securing an industrial placement they will be transferred on to a 4year full-time MEng programme.

In common with all engineering degrees at Kingston, students will take a common set of four (30 credit) modules at level 4 and share a common module in each of levels 5 and 7. The common first year allows all students to experience various engineering disciplines before deciding on an area of specialisation. Students chose their particular engineering pathway at the end of TB1 of the first year. Although students may have a firm idea of which branch of engineering they would like to study when they start exposure to a variety of branches in the first teaching block allows students to make a more informed choice. In addition, this structure provides valuable experience of working in interdisciplinary teams, an essential employability skill. Shared modules at level 5 and 7 give further opportunities for interaction across engineering disciplines and associated group work on real world problems. A feature of the learning and teaching strategy is a focus on active learning sessions at the expense of traditional didactic lectures.

The MEng Mechanical Engineering course is designed to equip students with the skills to work in many Engineering and related industries. Mechanical (Automotive) Engineers are found in a great many disciplines that require professional, intelligent and numerate individuals. This Course is designed to equip students with the ability to relate the knowledge and skills that they have learnt to the real world contexts in which they may work in the future. Students are actively encouraged to take part in the activities hosted by the School, such as Formula Student, TT-Bike racing, Robotics Club, Design Challenge and the Engineering Society amongst others.

The first two years of the MEng provides a broad foundation in Mechanical engineering appropriate to the aims, objectives and learning outcomes of the programme. All MEng graduates require a foundation that covers the broad spectrum of engineering, hence professional issues, engineering practice and topics such as computing and electrical and electronic systems are all introduced here. In the final two years, the programme deals in more depth with those topics which are more specific to Mechanical (Automotive) engineering along with more in-depth project work. The final year of the programme gives students the opportunity to work as part of a multi-disciplinary design team. It also gives students a broader and more in-depth perspective on engineering analysis and design.

The programme follows four themes or threads, firstly the appreciation and application of the principles of engineering science through the deepening subject areas of: mechanical systems (statics and dynamics), thermodynamics and fluid mechanics. Secondly, topics intended to widen the students’ knowledge base include electrical and electronic systems, engineering mathematics and computing. Thirdly there is a professional theme, introducing the students to the practice of a Mechanical engineer, covering such topics as professional practice, project management, quality and business management linked to a strong design theme and the other threads to emphasise the holistic nature of modern day engineering. Hence, the MEng provides both breadth and depth with an aim to develop the ability to identify, define and solve engineering problems from first principles.

The school is helped by its strong links with industry, local, national and international and these links influence the development of our programmes, working with our Industrial Advisory Board gives a forum where industry can inform us of the views of employers regarding the essential skills that they would want to see developed in a Kingston University undergraduate.

The course helps the students acquire a wide range of skills including independent learning, ability to work in teams, time management skills, verbal and written communication skills. Part of the role of the Personal Tutor is to encourage students to develop these skills outside of the curriculum as well as within it through extracurricular activities such as volunteering, positions of responsibility within clubs and societies, student ambassadorship and sports activities.

Graduates develop careers in all branches of mechanical and related engineering industries in the UK and throughout the world; as contract and consulting engineers, within local authorities, energy, aerospace, automotive, utility, manufacturing and transport companies, government organisations and the defence industry.

Technology enhanced learning such as videos, discussion forums and e-learning will be used together with the best traditional methods to provide a “blended learning” experience. In particular learning is supported by Kingston University’s excellent e-learning environments: VLE which can be easily accessed both on and off campus. Electronic submission and feedback is widely used on the programme to enable students to submit work and receive feedback from off campus

The MEng is offered as a four-year sandwich and full-time degree course with an industrial placement taken at level 6. The students who opt for the sandwich route must study and successfully complete 120 credits during their industrial placement year. The modules are studied using a combination of work based and blended learning models.

1. **Aims of the Field/Course**

The general aim of the course 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 produce graduates with a breadth and depth of knowledge and a thorough comprehension of the key aspects of Mechanical (Automotive) engineering.
* To allow students to develop analytical and problem-solving skills and an ability to evaluate evidence and assumptions to reach sound judgements and communicate these effectively.
* To provide graduates to industry who have a creative approach to the solution of design problems and the requisite technical skills to realise these solutions.
* To equip students with the research skills required for postgraduate study and the employability skills required for work in the Mechanical and related engineering industries.
* To furnish graduates with a firm grasp of sustainability and ‘Health and Safety within the context of their discipline.
* To ensure that graduates have the ability and confidence to take on leadership in major engineering projects.
* To provide graduates who have the reflective skills to recognise the need to continually develop themselves in order to exercise their Professional judgement.
* To equip students with a multidisciplinary skills and knowledge by providing a common first year across engineering disciplines and further common modules at levels 5, 6, and 7.
* To provide opportunities for students to integrate their industrial placement with studies and gain their level 6 credits through work based and blended learning models.
* To furnish students with leadership skills and know-how of generating new knowledge through research and development as required for chartered engineers.
1. **Intended Learning Outcomes**

The field/course provides opportunities for students to develop and demonstrate knowledge and understanding specific to the subject, key skills and graduate attributes in the following areas. The programme outcomes are referenced to the QAA subject benchmarks for Engineering (2015) and the Framework for Higher Education Qualifications in England, Wales and Northern Ireland (2008), and relate to the typical student.

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| **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 the core mechanical engineering subjects of statics, dynamics, materials, thermodynamics, fluid mechanics and design | B1 | Apply fundamental theoretical principles that underpin engineering and specifically mechanical engineering, to existing, new and emerging technologies | C1 | Use engineering workshop and laboratory equipment safely for manufacture and for experimental investigation  |
| A2 | Demonstrate knowledge of electrical and electronic systems, mathematical and computer models, control systems and basic manufacturing processes. | B2 | Use mathematics as a tool for solving complex problems from first principles, communicate the results, concepts and ideas  | C2 | Undertake practical work and analyse the data obtained for use in planning and design  |
| A3 | Show a knowledge of broader technical and non-technical engineering subjects | B3 | Think creatively and imaginatively to solve design problems  | C3 | Use a range of technical equipment and instruments, gaining an understanding of their underlying technology |
| A4 | Relate management and business applications to mechanical 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 problem solving |
| A5 | Demonstrate their understanding of the importance of 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 regulations within the work place and as they apply to mechanical design |
| A6 | Relate all their studies to a knowledge and understanding and promotion of sustainability and have an awareness of the environmental impact of their industry | B6 | Recognise the importance of professional bodies and the professional conduct expected of Chartered Engineers | C6 | Define a holistic and systematic approach to high-level risk identification, assessment and management |
| A7 | Demonstrate high-level of knowledge of mechanical (automotive) engineering related technologies and the principles associated with these | B7 | Demonstrate a high-level ability in problem analysis and synthesis of engineering principles both independently and as part of a team | C7 | Organise and lead work teams, coordinating high-level project activities and competitions |

**Table 1 – MEng Mechanical Engineering Programme Learning Outcomes**

In addition to the programme learning outcomes identified overleaf, the programme of study defined in this programme specification will allow students to develop a range of Key Skills as follows:

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

1. **Entry Requirements**

The minimum entry qualifications for the programme are:

From A levels: 128 points to include A2 mathematics at grade B plus two suitable science subjects.

BTEC National: Distinction, Distinction, Distinction (DDD) from an engineering-related BTEC Extended Diploma including Merit for Mathematics and Further Mathematics.

Access Diploma: 144 points at level 3 including Distinction and Maths, Mechanics and science modules.

Plus: GCSE (A\*-C) minimum of 5 subjects including English Language and Mathematics.

A minimum International English Language Testing System (IELTS) score of 6.0 (min 5.5 in Speaking, Writing, Listening and Reading) or equivalent is required for those for whom English is not their first language.

Students may transfer into level 6 of the MEng after successfully completing level 5 of the BEng (Hons) in Mechanical Engineering provided they have achieved B- average in level 5.

Direct entry to level 5 of the MEng is not normally permitted. The preferred route is to admit students on to level 5 of the BEng (Hons) and then to transfer to level 6 of the MEng provided they meet the provisions of the previous paragraph.

We will consider a range of alternative qualifications or experience that is equivalent to the typical offer. Applications from international students with equivalent qualifications are welcome.

1. **Field/Course Structure**

This programme is offered in full-time, part-time and sandwich modes. The full time mode is only used for those that are not able to secure a placement in the third year. If the students do not undertake a placement the designation ‘with industrial placement is removed from their award.

Intake is in September.

Entry is normally at Level 4 with A-level or equivalent qualifications (See section D). Transfer from a similar course is possible at Level 5 with passes in comparable Level 4 modules – but is at the discretion of the course team.

**E1. Professional and Statutory Regulatory Bodies**

N/A

**E2. Work-based learning, including sandwich courses**

A year-long industrial placement is integral to the 4 year MEng in Mechanical Engineering (Automotive Engineering) with industrial placement degree. At the end of their placement year students will be required to report on a substantial individual project based on their work placement. In addition students will take a business related work-based learning module and distance learning Advanced Mechanical Engineering module.

If students do not secure a placement the industrial individual project EG6015 and the applied business management module EG6025 will be delivered in way to mimic a work-based approach. Students will be given an industry sourced Research project, which they can carry out at Kingston University.

**E3. Outline Programme Structure**

Each level is made up of four modules each worth 30 credit points. Typically, a student must complete 120 credits at each level. All students will be provided with the University regulations and specific additions that are sometimes required for accreditation by outside bodies (e.g. professional or statutory bodies that confer professional accreditation). Full details of each module will be provided in module descriptors and student module guides.

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| **Level 4** (all core) |
| **Compulsory modules** | **Module code** | **Credit** **Value** | **Level**  | **Teaching Block** |
| Engineering Design and Professional Practice | EG4010 | 30 | 4 | 1&2 |
| Engineering Mechanics, Structures and Materials | EG4011 | 30 | 4 | 1&2 |
| Engineering Mathematics and Computing Applications | EG4012 | 30 | 4 | 1&2 |
| Fluid Mechanics and Engineering Science | EG4013 | 30 | 4 | 1&2 |

Progression to level 5 requires passes in all four modules to give 120 credits at level 4

Students exiting the programme at this point, who have successfully completed 120 credits, are eligible for the award of Certificate of Higher Education in Mechanical Engineering.

**Level 5 MEng Mechanical Engineering**

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| **Level 5** (all core) |
| **Compulsory modules** | **Module code** | **Credit** **Value** | **Level**  | **Teaching Block** |
| Electronic Systems, Control & Computing | ME5012 | 30 | 5 | 1&2 |
| Engineering Design, Materials & Manufacture 2 | ME5013 | 30 | 5 | 1&2 |
| Project Engineering and Management | EG5014 | 30 | 5 | 1&2 |
| Thermofluid & Mechanical Systems 2 | ME5011 | 30 | 5 | 1&2 |

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, are eligible for the award of Diploma of Higher Education in Mechanical Engineering.

**Level 5 MEng Mechanical Engineering (Automotive Engineering)**

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| **Level 5** (all core) |
| **Compulsory modules** | **Module code** | **Credit** **Value** | **Level**  | **Teaching Block** |
| Electronic Systems, Control & Computing | ME5012 | 30 | 5 | 1&2 |
| Engineering Design, Materials & Manufacture 2 | ME5013 | 30 | 5 | 1&2 |
| Project Engineering and Management | EG5014 | 30 | 5 | 1&2 |
| Automotive Systems I | ME5021 | 30 | 5 | 1&2 |

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, are eligible for the award of Diploma of Higher Education in Mechanical Engineering.

**Level 6 MEng Mechanical Engineering with Industrial experience**

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| **Level 6** (All core) |
| **Compulsory modules** | **Module code** | **Credit** **Value** | **Level**  | **Teaching Block** |  |
| Industrial Individual project | EG6015 | 60 | 6 | 1&2 | Work based |
| Applied Business Management | EG6025 | 30 | 6 | 1&2 | Work based |
| Computational Methods in Engineering and Control | ME6013 | 30 | 6 | 1&2 | Blended Learning |

**Level 6 MEng Mechanical Engineering with Industrial experience (Automotive Engineering)**

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| **Level 6** (at least 60 credits = core) |
| **Compulsory modules** | **Module code** | **Credit** **Value** | **Level**  | **Teaching Block** |  |
| Industrial Individual project | EG6015 | 60 | 6 | 1&2 | Work based |
| Applied Business Management | EG6025 | 30 | 6 | 1&2 | Work based |
| Automotive Systems II | ME6021 | 30 | 6 | 1&2 | Blended Learning |

**Level 7 MEng Mechanical Engineering with Industrial Experience**

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| **Level 7**  |
| **Compulsory modules** | **Module code** | **Credit** **Value** | **Level**  | **Teaching Block** |  |
| MEng Group Design Project | EG7000 | 60 | 7 | 1&2 |  |
| Advanced Stress Analysis & Materials | ME7723 | 30 | 7 | 1&2 | Week Block |
| Computational Fluid Dynamics for Engineering Applications | ME7724 | 30 | 7 | 1&2 | Week block |

**Level 7 MEng Mechanical Engineering with Industrial experience (Automotive Engineering)**

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| **Level 7**  |
| **Compulsory modules** | **Module code** | **Credit** **Value** | **Level**  | **Teaching Block** |  |
| MEng Group Design Project | EG7000 | 60 | 7 | 1&2 |  |
| Control Systems with Embedded Implementation | ME7731 | 30 | 7 | 1&2 | Week Block |
| Automotive Aerodynamics and Structural Analysis | ME7733 | 30 | 7 | 1&2 | Week Block |

MEng students who have not achieved 120 credits are eligible for a BEng (Hons) degree subject to having passed EG7000

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

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

**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 (e.g. Mathematics and IT in EG4012 **Engineering Mathematics and Computing**, practical skills (EG4011 and EG4013) and the initial development of key employability skills (EG4010). This provides a solid foundation for students to undertake 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 traditional lectures. At level 6 students, on industrial placement or not, will be expected to take greater ownership of their independent study with academics taking on more of a supervisory role particularly in the work based module EG6025 Applied Business Management and EG6015 Industrial Individual project.

Module guides 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 as videos, screencasts, on-line MCQs, discussion boards and interactive teaching packages. It will also deliver teaching material such as lecture notes/presentations, problems sets and worked examples. This helps support an inclusive approach as studentscan access learning material at their convenience and work through it at their own pace with the opportunity to pause and rewind as they wish.

**Integrated first year and interdisciplinary collaboration**

All engineering students at Kingston University take a common set of four (30 credit) modules. This allows all students to experience various engineering disciplines before deciding on an area of specialisation. Due to a specialist strand in TB2 for one of the modules, students are expected to pick the chosen engineering pathway at the end of TB1. Although students may have a firm idea of which branch of engineering they would like to study when they start (e.g. civil and infrastructure) exposure to a variety of branches in the first teaching block will allow students to make a more informed choice. The opportunity to study and work with students from different branches of engineering is a distinct feature of the course at Kingston and is extended into the second year when all students take a common level 5 module. In **EG4010** **Engineering Design and Professional Practice** students will be introduced to the principles and importance of group work. Project-based learning (PBL) is employed requiring interdisciplinary teams to design, build and present solutions to small scale engineering challenges, the outputs of these will be part of the summative assessment. Interdisciplinary group work will be further developed at level 5 in **EG5014 Project Engineering and Management** where students are taught about group project management in TB1 and then will spend much of TB2 working on a more complex challenge that will comprise 60% of the module assessment. In this module students are likely to tackle a live, real-world problem supplied by a well known company or organisation. This will give the students an opportunity to talk about how they have worked with an external company on an engineering problem as part of a team, when they apply for an industrial placement. At level 6, students on industrial placement will be able to apply their teamwork skills to the work environment.

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

A feature of the learning, teaching and assessment strategy in the School of Engineering is that many instructional lectures have been replaced by collaborative, problem solving or enquiry-based learning workshops and tutorials. These require 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. In these sessions, the lecturer facilitates learning by supporting students in creating their own knowledge and understanding. Lecturers may also introduce and summarize key concepts with short mini-lectures.

Project based Learning (PBL) is introduced in **EG4010** and developed further in **EG5014, EG6015** and **EG7000**. **EG7000** provides a capstone element to the course by providing an opportunity for students to work on a major engineering design problem in a team in a way which closely parallels a real-world project. These collaborative activities encourage students to draw on their own set of experiences and cultural backgrounds when tackling real world challenges. The Flipped classroom approach is introduced across the two-engineering science based modules (**EG4011**, **EG4013**) and the maths/computing module **EG4012**. Here the curriculum (lecture content) of a small topic is delivered via on-line materials (screencasts, videos or study packs) and then developed and applied in workshops.

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

The high percentage use of active learning sessions in the teaching hours is aimed at improving 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 supports 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 PT scheme, field work, industrial visits, extra-curricular seminars, research internships, course representative system, student ambassador work, peer mentoring, PAL civic engagement and outreach opportunities etc. This is also achieved through encouraging the students to take part in the hands-on activities hosted by the School, such as Formula Student, TT-Bike racing, Robotics Club, Design Challenge and the Engineering Society etc.

**Development of employability skills**

The progressive development of a range key employability skills is another feature of the course as exemplified in teamwork/groupwork as discussed above. Regarding communication skills, at level 4 the focus is on writing individual practical reports (**EG4013 Fluid Mechanics & Engineering Science**) using a standard format and style, and encouraging students to orally communicate the outcomes of small group exercises in the active learning sessions in **EG4010 and EG4011(Engineering Mechanics, Structures & Materials)**. At level 5 students will be required to produce a substantial written group report and present their individual findings in **EG5014** and in other modules such as ME5011 and ME5012individual or group laboratory reports on more challenging topics. To help development of these skills students will be required to submit a draft of a report for **EG4011** to the Support for Academic Success Centre for feedback and to discuss this with their personal tutor. At level 6 in the Individual Project module **EG6015** students will be guided on how to synthesise and critically review information from a variety of sources and report this and their research results in formal research reports and an oral presentation.

To complement the development of employability skills within the curriculum and to help students preparation for securing an industrial placement , 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; KU Talent events and opportunities. Activity in these areas is recognised by the university’s Kingston Award Scheme. KU Talent offers a range of events, including Careers Uncovered fairs, which include employers coming to campus to promote internship, placement and graduate opportunities, and spotlight on engineering networking activities where employers and alumni are invited on campus to talk about career pathways

**Hands-on Practical work**

Hands on practical experience in workshops and laboratories is fundamental in developing practical skills as well as enhancing data collection and analysis skills. Students will have the opportunity to work in laboratories and workshops 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 measurement and manufacturing processes and how to apply these in a laboratory and testing environment in **EG4010** and at level 5 the focus is on measurement of a variety of parameters. For instance in **ME5013** the students learn to work with structures and materials such as composites and using FEA and laboratory equipment to analyse and measure static and dynamic parameters. This is delivered through supervised practical sessions with experiment protocols. At level 6 students are expected to select and apply requisite practical skills in **EG6015 Industrial individual project**

Additionally, at level 6 the students, whilst working in industry as an intern, will study 120 credits using work based as well as distance learning models. The students will be provided with online study materials supported by online tutorials via the University VLE system. During the year students carry out an industrial individual project in the company with an assigned academic supervisor/advisor, investigate and analyse the business and management models of the company they are working for and study a specialised module in the area of mechanical engineering or automotive engineering.

At level 7 students study more specialised subjects such as **ME7723** Advanced Stress Analysis & Materials and **ME7724** Computational Fluid Dynamics for Engineering Applications providing tools to solve more complex problems. **ME7733** is a specialist module in Automotive Engineering where students learn to analyse, carry out research and design road vehicles. They also carry out an extensive Group design project to apply their knowledge to an integrated industrially-based problem.

**Research Informed Teaching**

The majority of the course team are either research active in engineering or are involved in industry related professional activities, through KTPs or other forms of 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.

Most of the teaching staff are also actively involved in the various Research Centres and/or Research Groups of the Faculty, or otherwise following interest areas of their own. These activities take them into, amongst other areas, materials research both coatings and compound, fire and explosion research both cause and prevention, dynamics and control research and on through sustainable power generation to electric vehicle technology with particular success in the development of the zero emissions electric motorbike. The modules at levels 7 are mainly taught and managed by academic staff who are engaged in research in various areas and include their research findings in addition to well established principles, for example in the modules **ME7723** the areas such as structures, materials including composites, structural dynamics, model testing, rotating machinery are taught and in the module **ME7724** research in Fluid Dynamics and CFD is discussed.

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 in wider pedagogic issues which will then feed through to support learning in lectures and other forms of student engagement in 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 the VLE system. The use of an Electronic Voting System in the class room 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 an exemplar to students in their future professional practice.

**Assessment for Learning**

The assessment strategy has been designed to help students to learn and prepare them for employment, rather than just as 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. **(EG4010, ME5013, EG5014, EG6015, EG7000)**.

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 (**EG6015, EG7000**). Examinations are still used as they are an effective way of assessing basic knowledge and understanding, and professional bodies expect to see examinations 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 examination from levels 4&5 to level 6&7. The use of a well-balanced range of assessment methods is a key part of our inclusive assessment strategy. Group and teamwork assessment is instrumental in developing and recognising this important employability skill.

**Engineering curriculum**

Level 5 of the core programme builds on the fundamental knowledge and skills gained at Level 4. It focuses on knowledge and understanding of the engineering principles underpinning Mechanical technologies. The Fluid Mechanics and Thermodynamics and Analytical methods extend the knowledge of students in Thermo-fluids at level 4 to applications in Power Engineering, Aerospace vehicles, and Energy systems, resulting in fundamental knowledge for design and optimisation of vehicle components, power-plants and various other Engineering systems. The mathematical skills and knowledge required to solve and analyse the related equations and complex data for the purpose of improving efficiency and optimising processes will be taught in this module The module involves the use of wind tunnel laboratories to enhance the students learning experience through Learning-By-Doing. Staff encourage students to develop curiosity and a desire to learn for life using active learning techniques. The problem-based and inquiry-based group work fosters collaborative thinking and develops attributes expected of a Mechanical graduate.

The Engineering Mechanics, Structures & Materials and Thermofluid & Mechanical Systems 2 & 3 introduce the application of Mechanical Engineering principles to different engineering materials, structural and dynamics analysis. The modules enhance the development of students’ analytical, problem-solving, critical thinking and laboratory skills. They provide an understanding of how the principles of structures and materials science determine the configuration, performance and stability of Mechanical systems. They also develop the software modelling skills of analysing composite structures using FEM techniques. The modules involve the use of laboratory experiments in the areas of structures, composites and vibrations. The Automotive Engineering pathway includes Automotive Systems I & II in levels 5&6, respectively, to cover design and analysis of automotive systems, materials and processes used in manufacturing automotive components, as well as emerging electric, hybrid and alternative fuel vehicle technologies.

The Electronic systems control and computing modules are designed to broaden students’ knowledge and understanding of the fundamental of electronics and control systems used in industries. In Mechatronics, Dynamics & Control, rigid body as well as flexible body Dynamics are taught at a more advanced level with the use of computational tools such as MATLAB which are widely used in industry with application in design and analysis of Mechanical systems.

The Engineering Project Management Module introduces the principles and commercial practices for the management of engineering projects and related wider business operations. The nature of project engineering and business management is considered in the context of time, quality, risk and sustainability aspects. It introduces the legal, commercial, social and ethical framework of engineering environments. This module provides opportunities for developing team-working in industrially based group design activities which will enhance students’ communication skills in group discussions and seminars.

Level 6 of the programme continues the Mechanical theme but it emphasises the development of self-management, independent learning, professional skills, and deep understanding of the knowledge required in Mechanical engineering.

In the Thermofluid & Mechanical Systems 3 (Automotive Systems II) module students are taught Fluid Mechanics and Thermodynamics at higher levels together with the application of computational techniques such as Computational Fluid Dynamics (CFD) widely used in industry. In the Thermofluid & Mechanical Systems 3 students are taught at a more advanced level topics in Structures and Materials together with use of computational methods such as Finite Element Analysis (In FEA).

In the Applied Business module students have the opportunity of applying their knowledge in Business, project planning and management and produce reports and assignments about the company in which they are undertaking their industrial placements. The students are provided with a great deal of information and supporting lecture material on the University VLE system and receive online support from academic staff.

Students will carry out an extensive industrial individual project at a company with supervision and access to various facilities at the University to produce a dissertation by the end of level 6. The Individual Project module combines the technical and academic facets of the programme and provides students with an opportunity to complete a capstone project applying the knowledge and skills learnt during the course to achieve agreed deliverables. It enables students to develop their research skills using and applying information from the technical literature.

At level 7 when the students return to University they will carry out a Group design project which will consist of substantial Project-Based Learning (PBL) driven by the students with supervisor/facilitators encouraging professionalism and leadership in a group activity. It provides students with an understanding of the process of project planning and an opportunity to put theory into practice in a virtual industrial project. The module encourages professionalism and leadership in a collaborative group setting in which sustainability and ethicsare embeddedwithin the project context. The above two modules develop the analytical and problem-solving skills of the students.

The programme is designed to develop the students’ academic and technical knowledge and understanding, their academic and professional skills, and their personal qualities, and ultimately prepare them for employment. The assessment strategy has been designed in the same way: to develop the students rather than simply assess them to make sure they satisfy learning outcomes. The assessment is designed to be authentic, engaging and transparent that contributes to helping students to learn and develop effective attributes. The assessment tasks focus on the real world-engineering activities that enhance students’ employability. A large variety of different assessment methods are used in the programme and all modules in the programme have formal and informal assessment, and formative and summative assessment associated with them. The forms of assessment include portfolio, Clicker quizzes, online tests using the VLE system, informal in-class tests, workbooks, practical exercises, tutorial questions, end-of-module examinations and even an individual viva exam which enable assessment of understanding of a broad range of Mechanical topics. All of the coursework that students complete is formative as well as summative. The formal and informal feedback from coursework and the informal assessment given enables the students’ to improve knowledge and skills. The informal feedback includes group discussion in classes, one-to-one dialogue, rehearsal of oral presentations, draft reports and peer assessment.

The university is strongly committed to an Inclusive Curriculum. Students will be encouraged to see themselves as belonging to a professional community. A set of employability criteria will be identified using insight from employers and the Employability Team. We will identify skills that employers think are needed from graduates using alumni or the Institution of Mechanical Engineers. This involves support from DARE (Development, Alumni Relations and Events department) to identify alumni who have graduated at least a year earlier. Each module will be examined to determine the opportunity to embed employability into the curriculum. Academic staff and members of the employability team will identify appropriate provision in the Centre for Graduate Excellence and, where necessary, tailor opportunities to bridge any gaps. Personal Tutors will enhance student engagement with these opportunities. Learning and teaching staff will highlight opportunities within their sessions that enable students to acquire the employability skills. Students will develop a CPD record in the VLE to draw upon for job applications and interviews. Personal Tutors will include employability criteria and reflective questions in their first meeting and record this on the system online.

**Inclusive Teaching Practice**

Staff Student Consultative Committees and Boards of Study provide opportunities for students to make suggestions 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 a 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.

**Employability/Placement**

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 KU Talent, including: Professional Communication, Time and Self-Management and Identifying and Articulating Skills. There are also opportunities to perfect skills required to gain employment such as: CV writing, Psychometric Test and Using LinkedIn. A student’s development and career options are discussed in personal tutor meetings and guidance given as appropriate. This is in liaison with the KU Talent team, the University’s Careers Service.

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

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

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 provide academic advice and guidance.
* There is a **Student Support and Engagement Team** to help students with any problem that is affecting their studies.
* A dedicated Undergraduate Course Administrator
* **An induction programme** and study skills sessions at the start of each academic year
* **SEC Academic Success Centre (SASC)** is a one-to-one drop-in Study Skills session for 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**
* **Talent A 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
* An Academic Team that seeks to maintain an open door policy in the spirit of supporting 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 Engineering. It is intended that the PTS be embedded within the provision of the MEng programme.

**Overall Aims**

* To build a rapport between staff and students and contribute to personalising students’ experience within the School of Engineering
* 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
* Since the Personal Tutor scheme is aligned with the student’s discipline, they will change Personal Tutors if they change disciplines.

There are specific aims and outcomes for each level, as the PTS is progressive and cumulative students will find that they are building on the skills developed in previous levels.

Formative assessment will be provided in the form of regular feedback during meetings.

The assessment in modules **EG4010** and **EG5014** is directly linked with the PTS scheme. Personal tutorials also provide opportunity to consider CV writing skills, discussion of skill sets, learning and revision techniques, as well as employment and extracurricular opportunities. Group tutorials allow students to discuss issues and help with solutions to problems.

Attendance at personal tutorials is signed off by tutors using the facility on OSIS. The PTS Lead oversees the scheme in the School in liaison with the Faculty PTS Lead. Regular reports on student attendance in personal tutorials are consulted and may feed into other student support measures to catch potentially struggling students.

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

**Aims and Learning Outcomes**

* To assist students in making the transition to Higher Education and to generate a sense of belonging to the School Engineering 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
* To prepare students to make the most of feedback throughout their course

**Contact:**

* Teaching block 1: three one-to-one meetings during induction week, weeks 2 and 6-7
* Teaching block 2: two one-to-one meetings during week 1 and week 6-7
* End of academic year individual ‘wrap up’ email

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

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

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

**Aims and Learning Outcomes**

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

**Contact:**

* One-to-one meeting in week 1
* Email contact at the end of teaching block 1
* Individual ‘wrap up’ email at end of academic year

Throughout the year, students are expected to reflect on their acquisition of skills and preparation for and industrial placement and employment with their personal tutors. This activity is integrated into **EG5014** and constitutes 10% of the module assessment.

**Level 6**

During the placement year, students will be assigned an academic supervisor for their project. It is expected that the academic supervisor will be the primary contact during the year. If the academic supervisor is not the student’s personal tutor, students will be able to gain additional support from their personal tutor if required.

**Level 7: Getting the most out of the Masters**

**Aims and Outcomes**

* To help students to make the transition to Masters level study and understand how to use feedback on the level 7 course.
* To encourage students to be proactive in making links between their course and their professional and/or academic aspirations
* To explore students’ research aspirations
* To help students gain confidence in contributing to, and learning from, constructive peer review
* To encourage students to become part of a wider disciplinary and/or professional community

**Minimum Contact (normally):**

* Meetings will be scheduled as appropriate to the delivery pattern of the course.

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

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

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

* External examiners
* Boards of study with student representation
* Annual review and development
* Periodic review undertaken at subject level
* Student evaluation
* Moderation policies
1. **Employability Statement**

The curriculum embeds the development of employability skills throughout the course and is designed to equip students with the ability to relate the knowledge and skills that they have learnt to the real-world contexts in which they may work in the future. Group work in conjunction with external organisations at level 4 will provide students with relevant experience to add to their CV when they are applying for placement in level 5. Students are required to produce a CV early at level 5 and to improve this following feedback. The Industrial Placement at level 6 is integral to the course and will strengthen students’ employability. They are supported throughout the period by their personal tutor, who will visit them at their place of work on at least one occasion. The University tutor will discuss progress with the student and employer and will recommend any improvements to the learning opportunities.

Graduates develop careers in all branches of mechanical, automotive and related engineering industries both here in the UK and throughout the world; as contract and consulting engineers, within local authorities, utility, manufacturing and transport companies, government organisations and the defence industry. In many cases, students taking an industrial placement are able to secure employment with the placement organisation following graduation. The academic and key skills developed throughout an engineering course also allow graduates to follow careers in other professions such as ICT, finance, accountancy and teaching.

Professional practice in is introduced in the first year in the module **EG4010**, in which the students are introduced to the employment opportunities in the specialist engineering field, this is followed through all other modules at levels 5, 6 and 7, especially in **EG5014 Project Engineering and Management, EG6025 Applied Business Management and EG6015 Industrial Individual project.**

1. **Approved Variants from the Undergraduate or Postgraduate Regulations**
2. **Other sources of information that you may wish to consult**

Engineering subject benchmark:

[www.qaa.ac.uk/Publications/InformationAndGuidance/Pages/Subject-benchmark-statement-Engineering-.aspx](http://www.qaa.ac.uk/Publications/InformationAndGuidance/Pages/Subject-benchmark-statement-Engineering-.aspx)

Professional bodies:

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

Professional accreditation:

[www.engc.org.uk/](http://www.engc.org.uk/)

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

School Website:

<http://sec.kingston.ac.uk/about-SEC/subjects/mechanical-and-automotive-engineering/>

**Development of Field/Course Learning Outcomes in Modules**

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Module code** | **Level 4** | **Level 5** | **Level 6** | **Level 7** |
| EG4010 | EG4011 | EG4012 | EG4013 | ME5012 | ME5013 | EG5014 | ME5011 | ME5021 | EG6015 | EG6025 | ME6013 | ME6021 | EG7000 | ME7723 | ME7724 | ME7731 | ME7733 |
| **Knowledge & Understanding** | A1 |  | S |  |  | S |  |  | S | S | S |  |  | S |  | S |  | S | S |
| A2 |  |  | S | S | S |  |  |  | S |  | S | S | S |  | S | S | S |  |
| A3 |  |  |  |  | S | S | S |  | S |  |  |  | S | S |  |  | S | S |
| A4 |  |  |  |  |  | S | S |  |  |  | S |  |  |  | S |  | S |  |
| A5 |  |  |  |  |  | S | S |  | S | S | S |  | S | S |  |  |  |  |
| A6 |  |  |  |  |  | S |  |  |  |  |  |  |  | S |  |  |  |  |
| A7 |  |  |  |  |  |  |  |  | S |  |  | S | S |  | S | S |  |  |
| **Intellectual Skills** | B1 |  | S | S | S | S |  | S | S | S |  | S |  | S |  | S | S |  | S |
| B2 |  | S | S | S |  |  | S | S | S |  | S | S | S | S | S | S |  |  |
| B3 |  |  |  |  | S |  | S |  | S |  |  |  | S | S |  |  |  |  |
| B4 | S |  |  |  |  | S |  |  |  | S |  |  | S | S |  |  |  |  |
| B5 | S |  |  |  |  | S | S |  |  |  | S |  |  |  |  |  |  |  |
| B6 | S |  |  |  |  | S |  |  |  |  | S |  |  |  |  |  |  |  |
| B7 |  |  |  |  |  |  |  |  | S | S | S | S | S | S | S | S |  |  |
| **Practical Skills** | C1 | S |  |  |  |  |  |  |  |  | S |  |  | S |  |  |  | S | S |
| C2 | S | S | S |  | S |  | S |  | S | S | S | S | S |  | S |  |  | S |
| C3 | S |  | S |  |  |  |  |  | S | S |  |  | S | S |  |  | S | S |
| C4 |  |  | S | S | S | S | S |  | S | S |  | S | S | S | S | S | S |  |
| C5 | S | S |  |  |  | S | S |  |  |  |  |  |  |  |  |  |  | S |
| C6 |  |  |  |  |  |  |  |  |  |  | S |  |  |  |  |  |  |  |
| C7 |  |  |  |  |  |  |  |  |  | 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.**

**Technical Annex**

|  |  |
| --- | --- |
| **Final Award(s):** | MEng Mechanical Engineering with industrial experience |
|  | MEng Mechanical Engineering (Automotive Engineering) with industrial experience |
| **Intermediate Award(s):** | Cert HE in Mechanical EngineeringDip HE in Mechanical EngineeringBEng Mechanical Engineering BEng (Hons) Mechanical EngineeringBEng (Hons) Mechanical Engineering (Automotive Engineering)  |
| **Minimum period of registration:** | FT-4 years, PT- 8 years  |
| **Maximum period of registration:** | FT- 8 years, PT- 12 years |
| **FHEQ Level for the Final Award:** | Level 7 |
| **QAA Subject Benchmark:** | Engineering |
| **Modes of Delivery:** | Sandwich and Full-time |
| **Language of Delivery:** | English |
| **Faculty:** | SEC |
| **School:** | Engineering |
| **Department:** | Mechanical and Automotive Engineering |
| **JACS code:** | H300 |
| **UCAS Code:** |  |
| **Course/Route Code:** |  |
|  |  |