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**Programme Specification**

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

BEng (Hons) Automotive Engineering (Motorsport)

**Date Specification Produced:** February 2016

**Date Specification Last Revised:** September 2019

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 Student Handbooks and Module Descriptors.

**SECTION 1: GENERAL INFORMATION**

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| **Title:** | BEng (Hons) Automotive Engineering  BEng (Hons) Automotive Engineering (Motorsport) |
| **Awarding Institution:** | Kingston University |
| **Teaching Institution:** | Kingston University |
| **Location:** | Roehampton Vale Campus, Kingston |
| **Programme Accredited by:** |  |

**SECTION 2: THE PROGRAMME**

1. **Programme Introduction**

The Programme is designed for undergraduate students who wish to study Automotive Engineering to Honours Degree level and aspire to achieve the professional status of Chartered Engineer (CEng). The Programme embraces recent developments in education and industry. The 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 Guidelines.

Students on the BEng Automotive Engineering course will have the unique opportunity to obtain a very strong theoretical background and excellent hands-on skills, while using state-of-the-art equipment, such as the Roehrig shock dyno, an engine test cell and a hydraulic dynamometer. The students will also have the opportunity to design and analyse parts, using industry standard CAD/CAE software; manufacture them, using the latest CNC machining and additive manufacturing methods (3D printing) in combination with industry standard CAM software; measure their strength, using contemporary tensile and fatigue testing machines. Furthermore, interested final year students may take an individual project related to the design and manufacture of aerodynamic surfaces, such as spoilers, and/or scaled vehicle models, which they will then put in one of the two wind tunnels of the School and measure the flow around them, using the state-of-the-art Laser Doppler Velocimetry technique.

Students on both the BEng Automotive Engineering course and the BEng Automotive Engineering (Motorsport) course will have the exciting opportunity to participate in various competitions, ranging from national student competitions, such as the IMechE Design Challenge competitions for engineering students, to international students competitions, such as the infamous IMechE Formula Student competition, up to professional world competitions, such as the notorious Isle of Man race. For the latter two competitions, the students may participate as members of the KU racing team (competing with a single seater electric race car) and the KU TT-Bike team (competing with an electric race bike).

Especially, the students on the Motorsport pathway will have the opportunity to create engine maps for high performance motorbikes (e.g. Suzuki GSXR1300 Hayabusha), using a rolling road; to measure the engine torque and power of high performance cars (e.g. Lotus Exige, Formula Asia), using a hydraulic dynamometer; to prepare a Caterham Academy car and compete in the Caterham Academy Championship.

Also, students on both courses will have the thriving opportunity to engage with state-of-the-art projects involving Unmanned Ground Vehicles, such as the Mars Rover, and Unmanned Aerial Vehicles, such as quadcopters.

The whole Programme is intended to equip graduates with the knowledge, comprehension, intellectual ability and subject practical skills to become professional Automotive Engineers or to follow careers in related professional areas. Employability is a key element of the Programme and hence the emphasis on communication, interpersonal and other skills that today’s industry sees as enhancing employment prospects.

The main Automotive Engineering Programme broadly follows four themes or threads, firstly the appreciation and application of the principles of automotive engineering science with emphasis on the 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, automotive systems (dynamics and control systems) as well as design and analysis of automotive components. Thirdly there is a professional theme, introducing the students to the practice of an Automotive Engineer, covering such topics as professional practice, project management, quality and business management. Lastly there is a strong design theme linking together the other threads and emphasising the holistic nature of modern day automotive engineering.

Likewise the motorsport engineering pathway also follows these main themes but here the second theme is intended to widen the students’ knowledge base on the design, analysis and optimization of systems and components for high performance vehicles. Whilst the third theme introduces the students to the practice of a Motorsport Engineer, covering such topics as professional practice, project management, quality, risk assessment and business management in motorsport.

The main BEng Course and its pathway emphasises the development of practical skills and experimentation through the extensive use of laboratories, workshop access and industrial visits. Sustainability and ‘Health and Safety’ are threaded throughout the Programme’s modules. There is a great deal of support available to students, both pastorally and academically, but in particular they are supported by a Personal Tutor Scheme (PTS) in which they are allocated a member of staff who, normally through one-to-one meetings, will assist and encourage students in their academic learning for the duration of their Course.

The BEng(Hons) is offered as a three-year full-time degree course or a four-year sandwich course or on a part-time basis over a period of six years. The sandwich course includes an industrial placement taken between level 5 and level 6. The first two levels of the BEng programme (i.e. levels 4 and 5) are common with the MEng programme and students showing a consistently good performance over both years can be offered a place on the MEng, starting at level 6 of that programme, should they wish to transfer.

1. **Aims of the Programme**

The general aims of the course are:

* To equip graduates with high skills required for work in the automotive and related industries, with emphasis on positions which require the application of contemporary technologies and can lead to promotion at high levels of management.
* To meet the academic requirements (when combined with approved further learning) for Chartered Membership of the Institution of Mechanical Engineers (IMechE).

More specific aims of the course are:

* To allow students to develop analytical, creative and problem-solving skills in order to reach sound solutions and communicate these effectively.
* Especially for the students on the Motorsport pathway, to equip them with the knowledge and skills related to the application of latest technologies on high-performance vehicles and introduce them into motorsport competitions as members of a team.

1. **Programme Learning Outcomes**

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills and other attributes in the following areas. The programme outcomes are referenced to the QAA subject benchmarks for Engineering (2010) 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 engineering subjects of statics, dynamics, materials, thermodynamics, fluid mechanics and design | B1 | Apply fundamental theoretical principles that underpin engineering and specifically automotive engineering | C1 | Use workshop and laboratory equipment safely for manufacture and experimental investigation |
| A2 | Demonstrate knowledge of electrical and electronic systems, control and manufacturing | B2 | Use mathematics as a tool for solving complex problems, communicating 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 a basic understanding of their underlying technology |
| A4 | Relate management and business applications to automotive engineering and/or motorsports | 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 of sustainability and 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 risk identification, assessment and management |
| A7 | Demonstrate knowledge of automotive 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 project activities |

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 |  |  |  |

**D. Entry Requirements**

The minimum entry qualifications for the programme are:

From A levels: At least 280 points from 3 A-Level subjects to include Mathematics at a minimum grade of “C” and two Science subjects (e.g. Physics, Chemistry). Overseas equivalent qualifications are accepted.

BTEC: An engineering-related BTEC Extended Diploma with at least “Distinction, Merit, Merit” (DMM).

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.

1. **Programme Structure**

This Programme is offered in full-time, sandwich and part-time modes. Intake of all modes of study is normally in September.

Entry to any mode is normally at level 4 with A-level or equivalent qualifications (See section D). Transfer from a similar programme is possible at level 5 with passes in comparable level 4 modules – but is at the discretion of the course team and subject to the limitations and guidance of the accrediting professional body.

**E1. Professional and Statutory Regulatory Bodies**

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

Work placements are actively encouraged – although it is the responsibility of individual students to source and secure such placements. This allows students to reflect upon their own personal experience of working in an applied setting, to focus on aspects of this experience that they can clearly relate to theoretical concepts and to evaluate the relationship between theory and practice. The placement must be approved by Kingston University. During their placement students will be visited at least once by a member of the School of Mechanical and Automotive Engineering. The placement is assessed and successful completion is required for the award of the sandwich course. The credits are not graded and do not contribute to the final classification. If a student is unable to find a suitable placement, they will have to transfer to the non-sandwich route.

**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 Applications and Practice | ME4010 | 30 | 4 | 1&2 |
| Thermofluid & Mechanical Systems 1 | ME4011 | 30 | 4 | 1&2 |
| Analytical Methods, Computing & Electronic Systems | ME4012 | 30 | 4 | 1&2 |
| Engineering Design, Materials & Manufacture 1 | ME4013 | 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. | | | | |

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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 | ME5014 | 30 | 5 | 1&2 | |
| Automotive Dynamics and Control Systems | ME5021 | 30 | 5 | 1&2 | |
| **Level 5** (Motorsport pathway core) |  |  |  |  | |
| **Pathway**  **modules** | **Module code** | **Credit**  **Value** | **Level** | **Teaching Block** | |
| Engine and Vehicle Principles | ME5051 | 30 | 5 | 1&2 | |
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| Students on the Motorsport pathway take ME5051 instead of ME5021.  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. | | | | |

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| **Level 6 (**all core) | | | | | |
| **Compulsory modules** | **Module code** | **Credit**  **Value** | **Level** | **Teaching Block** | |
| Business Management & Quality Systems | ME6010 | 30 | 6 | 1&2 | |
| Mechatronics, Dynamics & Control | ME6012 | 30 | 6 | 1&2 | |
| Individual Project (BEng/MEng) | ME6014 | 30 | 6 | 1&2 | |
| Automotive Systems Design and Analysis | ME6021 | 30 | 6 | 1&2 | |
| **Level 6** (Motorsport pathway core) |  |  |  |  | |
| **Pathway**  **modules** | **Module code** | **Credit**  **Value** | **Level** | **Teaching Block** | |
| Race Vehicles Design and Optimization | ME6051 | 30 | 6 | 1&2 | |
| Students on the Motorsport pathway take ME6051 instead of ME6021.  Level 6 requires the completion of the compulsory modules. | | | | |

The pass mark for the BEng Automotive Engineering course and the BEng Automotive Engineering (Motorsport) course is 40% for Levels 4, 5 and 6, respectively.

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

This programme has been designed taking into account the Kingston University Curriculum Design Principles to help develop student learning from dependent to independent learning and encourage lifelong learners. A wide range of teaching and learning methods is utilised, allowing students to be fully engaged throughout the course.

The programme aims at attracting a diverse cohort, with students coming from a wide range of backgrounds in terms of their education, age, gender, race, religion, sexual orientation and disability. This is seen as a strong feature of the programme and results in the curriculum being designed to be as inclusive as possible. In particular, the Level-4 of the programme is very general and allows everyone to develop their weaknesses and use their strengths to help their colleagues. Teaching, learning and assessment methods are constructed to align with the learning outcomes and syllabus content of the modules. The assessment regime of a module is designed to provide formative opportunities that allow students to improve their performance following feedback in preparation for later summative assessment. Key skills are developed throughout the programme, which are assessed both formatively and summatively. Students also have access to Academic Success Centre for additional support on a drop-in basis giving students the opportunity to take responsibility for their own achievements and consequent learning. Generally the course will be delivered by instructional lectures whilst associated problem solving tutorials, laboratory practicals, industrial visits and design classes are used to enhance the lecture material. The course is devised to encourage and develop students making them confident in their interpersonal and communication skills, as well as emphasising group work, data analysis and ICT skills. The contact hours associated with a module very much depends on the module type, but typically a module would comprise five hours per week of contact, which would include lecture, seminar/tutorial and design/practical sessions in various combinations.

A range of assessment methods are used enabling students to, in the initial stages of the programme, demonstrate their acquisition of the relevant knowledge, whilst in the later stages of the course the higher skills needed in industry, such as problem solving, synthesis and critical analysis are brought to the fore. Methods such as oral presentations, multiple choice questions, online assessment, written examinations, group and individual project reports, laboratory reports, peer making and informal question and answer sessions are all likely to be used depending on the learning setting. The use of a range of assessment methods is intended to ensure that no student is disadvantaged despite their educational background or disability and care is taken to avoid as far a possible bunching of assessment deadlines.

Whilst the work at level 4 concentrates on recall of fundamental concepts, the work at the higher levels applies this knowledge and understanding to engineering problem solving, often with significant levels of unfamiliarity and complexity. During their final year, level 6, students are expected to be able to synthesise and critically evaluate knowledge from various diverse sources. The level 6 individual “capstone” project module is likely to involve the development of new information generated by the students themselves.

The teaching and learning strategies utilised in this course are formulated to cultivate key transferable skills considered central to academic, vocational and personal development. These skills underpin how students learn, their ability to recognise their own achievement and ability, to review and evaluate that achievement and identify future learning requirements.

***Research Informed Teaching***

The course team demonstrates both research and industry related professional activity, which was taken into account when forming the course design and content. This activity is normally presented to the Industrial Advisory Board, which provides useful feedback.

Most of the teaching staff are also actively involved in the various Research Centres and/or Research Groups of the Faculty, or may be following interest areas of their own. Among others, such activities include the design and analysis of various vehicles, such as Unmanned Aerial and Ground Vehicles, a Formula Student single seater electric race car, a zero emission commuter bike and a zero-emission electric TT-bike. Other topics of research include, but are not limited to, electromagnetic bearings and magnetic levitation, the design of an active control electromagnetic suspension, the optimized design of aerodynamic surfaces, diesel engine cylinder output equalisation, vibration free engine startup and shutdown through adaptive integrated starter generator input shaping. Many modules extensively use case studies from the teaching teams own research to illustrate current issues and thinking within their area of interest.

Students are also able to and 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 evidentiary information in an argument, which are of great value to employers.

Members of staff are also engaged widely with the research and development of ideas in teaching and learning in Higher Education and into wider pedagogic issues which will then feed through to support learning in lectures and other forms of student engagement the programme, both formal and extra-curricular.

***Technology Enhanced Learning***

The use of appropriate technologies to enhance and develop learning is strongly encouraged. All modules will make use of the university’s virtual learning environment StudySpace, not just as a repository but as an active learning tool, for example the use of video and audio recordings of lectures to additionally explain complex concepts and techniques is encouraged. Additional links to appropriate online information sources should be provided along with sign posts to appropriate resources, including Massive Open Online Courses (MOOCs) and Open Educational Resources (OERs). However, the use of technology should not be restricted to the VLE, but should also embrace mobile technology and encourage students to use their mobile devices to enhance their own learning experience; this may well involve the use of social media or other application as additional aids to learning, again where appropriate given the nature of the particular module.

***Assessment methods***

Various assessment methods are adopted appropriate to each module to enable students to demonstrate their acquisition of knowledge and skills along with the development of their learning, as outlined in the module learning outcomes. The assessment regime for each module has been designed to provide formative opportunities that allow students to improve their performance, following feedback, in preparation for summative assessment. These formative opportunities will include, but not be restricted to, on-line assessment with immediate feedback, use of voting system in class (clickers), feedback on presentations (where appropriate involving industrial partners), peer and self-assessment with tutorial support and discussion etc.. The development of skills is threaded throughout the programme and assessed both formatively and summatively. Some of the methods of assessment used in the course are:

* Report writing
* Individual and group project reports
* Individual and group designs
* Investigation of case studies
* Model building
* Short in-class tests
* Unseen and seen formal written examinations
* Individual and group practical laboratory reports
* Computer software and output analysis
* Individual and group oral presentations
* Posters

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

Students are supported by:

* A Module Leader for each module
* A Course Director to help students understand their programme structure and provide academic support
* A Personal Tutor (PT) to provide academic and personal support
* A Student Support Officer (SSO) who provides additional pastoral and practical advice and support, especially to students encountering difficulties
* A dedicated Undergraduate Course Administrator
* An induction programme and study skills sessions at the start of each academic year
* An Academic Study Centre to provide support and advice to students on a daily ‘drop-in’ basis
* StudySpace – a versatile on-line interactive intranet and learning environment accessible both on-site and remotely
* A Student Voice Committee with student Course Representatives for each level
* 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 Union of Kingston Students
* 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 Mechanical and Automotive Engineering**

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

**Overall Aims**

* To build a rapport between staff and students and contribute to personalising students’ experience within the School of Mechanical and Automotive 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

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.

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

**Aims and Outcomes**

* To assist students in making the transition to Higher Education and to generate a sense of belonging to the School of Mechanical and Automotive 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: normally, three one-to-one meetings during induction week, weeks 2 and 6-7
* Teaching block 2: normally, two one-to-one meetings during week 1 and week 6-7
* End of academic year individual ‘wrap up’ email

**Embedded Module: ME4010 Engineering Applications and Practice**

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| **Outcome:** | **Assessment** |
| To assist students in making the transition to Higher Education and to generate a sense of belonging to the School of Mechanical and Automotive Engineering | Formative (one to one meetings) |
| To help students’ to develop good academic habits and to gain the confidence to operate successfully in a university context | Formative (one-to-one meetings, plus discussion and if necessary short exercises exploring such issues as email etiquette, report writing and general study skills) |
| To prepare students to make the most of feedback throughout their course | Formative (one-to-one 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:**

* Normally, 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

**Embedded Module: ME5014 Project Engineering and Management**

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| **Outcome:** | **Assessment** |
| To help students comprehend and plan for the academic demands of level 5 and to support increasing independence | Formative (one-to-one meetings, an explanation of how Level 5 modules contribute to degree classification, and any other differences in course structure and assessment procedures between Level 4 and Level 5) |
| To encourage students to look forward, to take up opportunities to develop wider skills and to take responsibility for their personal development | Formative (one-to-one meetings and preparation of a dissertation proposal or choice for level 6, plus discussions around planning for relevant placement activity) |
| To foster students’ ability to build on, and respond proactively to the feedback they have received | Formative (one-to-one meetings and discussions within module tutorial/seminar sessions) |
| To assist students in reflecting on the skills that they are developing and consider how they relate to employability | Formative (one-to-one meetings and preparation of a Curriculum Vitae) |

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

**Aims and Learning Outcomes**

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

**Contact:**

* Normally, 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

**Embedded Module: ME6014 Individual Project (BEng/MEng)**

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| **Outcome:** | **Assessment** |
| To support students with the planning necessary to maximise success in their final undergraduate year | Formative (one to one meetings) |
| To encourage students to reflect on the employability skills they have developed and be proactive in moving towards a professional life and/or further study | Formative (one to one meetings, along with the preparation and oral presentation of their Individual Project, the university Employability and Careers Service also provides activities which need to be signposted to students) |
| To help students 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 | Formative (one to one meetings) |

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 the subject level
* Student evaluation
* Moderation policies

1. **Employability Statement**

The BEng Automotive Engineering and BEng Automotive Engineering (Motorsport) courses are designed to equip students with the skills to work in the automotive and related industries. Automotive Engineers are found in a great many disciplines that require professional, intelligent and numerate individuals. Both curricula embed the development of employability skills and are 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 required to produce a CV early at level 5 and to improve this following feedback from Personal Tutors, placement advisors and Careers and Employability Service staff, ensuring that students have a good, high quality CV ready for sending out to potential employers. Employability is greatly enhanced by many of the extracurricular activities that students become involved in and students are encouraged to reflect upon these activities and include them in their CV as appropriate. Students are actively encouraged to take part in the activities hosted by the School, such as the IMechE Formula Student project, the Robotics Club, the IMechE Design Challenge competitions, the Isle-of-Man race and the Engineering Society amongst others.

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 employability skills that they would want to see developed in a Kingston University undergraduate. To that end the School strongly encourages and supports all students in applying for positions in industry for an Industrial Placement year. This would normally take place between levels 5 and 6. The School emphasises the benefits to be obtained from an approved placement in industry in terms of future employability. An Industrial Placement comprises a period of at least 36 weeks with an approved employer. Students are required to maintain a log book of their activities and involvement and produce a final report on their placement. 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 tutor will discuss progress with the student and employer and will recommend any improvements to the learning opportunities. Students fulfilling the requirements for an Industrial Placement will be awarded a Sandwich Degree on the completion of level 6.

As well as discipline specific employability skills, the more generic employability skills are also embedded within the programme. During the first year in modules such as Engineering Application and Practice, students are encouraged to consider their chosen discipline in the light of the activities of the Professional Bodies. Again in the level 5 Project Engineering and Management modules the various careers within engineering are considered and students are encouraged to reflect on the paths open to them and to develop the skills and attributes employers are looking for in graduates. These include independent learning, the 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.

Both courses have been designed to fulfil the core curriculum requirements (with further learning) for Chartered Engineer (CEng) status. Most graduates will aspire to careers in automotive related industries and to becoming Chartered Engineers. Graduates develop careers in all branches of automotive, motorsport and related industries both here in the UK and throughout the world; as contract and consulting engineers, within local authorities, 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 automotive engineering course also allow graduates to follow careers in other professions such as teaching. In addition, a number of graduates will progress to MSc courses in Engineering and related specialist areas before continuing their career in industry or research.

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

**Compensation**

Compensation is not permitted for the following modules:

ME6014 Individual Project (BEng/MEng)

**Reassessment of Level 6**

Reassessment of failed ME6014 module will normally be by repeat only with a new project brief.

1. **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

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/schools/mechanical-and-automotive-engineering/>

**Development of Programme Learning Outcomes in Modules**

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

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | **Level 4** | | | | **Level 5** | | | | | **Level 6** | | | | |
| **Module Code** | |  | ME4010 | ME4011 | ME4012 | ME4013 | ME5012 | ME5013 | ME5014 | ME5021 | ME5051 | ME6010 | ME6012 | ME6014 | ME6021 | ME6051 |
| **Knowledge & Understanding** | | A1 |  | 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 | S |
| A4 |  |  |  |  |  |  | S |  |  | S |  |  |  |  |
| A5 |  |  |  |  |  |  | S | S | S |  |  | S | S | S |
| A6 |  |  |  | S |  |  | S |  |  | S |  | S |  |  |
| A7 |  |  |  |  |  |  |  | S | S |  |  |  | S | S |
| **Intellectual Skills** | | B1 |  | S | S | S | S | S |  | S | S |  | S |  | S | S |
| B2 |  | S | S |  | S |  |  | S | S |  | S |  | S | S |
| B3 |  |  |  | S |  | S |  | S | S |  |  | S | S | S |
| B4 | S |  |  | S |  |  | S |  |  |  |  |  | S | S |
| B5 | S |  |  |  |  |  | S |  |  |  |  | S |  |  |
| B6 | S |  |  |  |  |  | S |  |  | S |  |  |  |  |
| B7 |  |  |  |  |  |  |  | S | S |  |  |  | S | S |
| **Practical**  **Skills** | | C1 | S |  |  | S |  |  |  |  |  |  | S |  | S | S |
| C2 | S | S | S | S |  | S |  | S | S |  | S |  | S | S |
| C3 | S |  | S |  |  |  |  | S | S |  |  |  | S | S |
| C4 |  |  | S | S | S | S | S | S | S |  | S |  | S | S |
| C5 | S | S |  | S |  |  | S |  |  |  |  |  |  |  |
| C6 |  |  |  |  |  |  |  | S | S |  |  |  | S | S |
| C7 |  |  |  |  |  |  |  | S | S |  |  |  | S | S |

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

**Indicative Module Summative Assessment Map**

This map identifies the elements of summative assessment for each module. Course teams are reminded that:

* There should be no more than three elements of assessment per module
* There should be no more than one formal examination per module.
* Synoptic assessments that test the learning outcomes of more than one module are permitted

Students will be provided with formative assessment opportunities throughout the course to practice and develop their proficiency in the range of assessment methods and to facilitate ‘feed-forward’ as stipulated in the [Curriculum Design Principles](http://blogs.kingston.ac.uk/raf/2012/05/22/welcome-2/)

| **Module** | | | | | **Coursework** | | | **Examination** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Level** | **Module Name** | **Module code** | **Credit value** | **Core/**  **option** | **Type** | **Word Length** | **Weighting %** | **Written/**  **practical** | **Duration** | **Weighting%** |
| 4 | Engineering Applications and Practice | ME4010 | 30 | C | Laboratory, assignment & project reports | N/A | 100 |  |  |  |
| 4 | Thermofluid & Mechanical Systems 1 | ME4011 | 30 | C | Laboratory reports & in-class tests | N/A | 40 | W | 2 hrs. | 60 |
| 4 | Analytical Methods, Computing & Electronic Systems | ME4012 | 30 | C | Written assignment & in-class tests | N/A | 100 |  |  |  |
| 4 | Engineering Design, Materials & Manufacture 1 | ME4013 | 30 | C | Laboratory & design reports (group & individual) + in-class tests | N/A | 70 | W | 2 hrs. | 30 |
| 5 | Electronic Systems, Control & Computing | ME5012 | 30 | C | On-line laboratory exercises & assignment | N/A | 50 | W | 3 hrs. | 50 |
| 5 | Engineering Design, Materials & Manufacture 2 | ME5013 | 30 | C | Design reports | N/A | 100 |  |  |  |
| 5 | Project Engineering and Management | ME5014 | 30 | C | Project reports (group & individual) | N/A | 40 | W | 3 hrs. | 60 |
| 5 | Automotive Dynamics and Control Systems | ME5021 | 30 | C | Laboratory & assignment reports & final exam | N/A | 40 | W | 3 hrs. | 60 |
| 5 | Engine and Vehicle Principles | ME5051 | 30 | C | Laboratory & assignment reports & final exam | N/A | 40 | W | 3 hrs. | 60 |
| 6 | Business Management & Quality Systems | ME6010 | 30 | C | One in-class test & one assignment | N/A | 50 | W | 3 hrs. | 50 |
| 6 | Mechatronics, Dynamics & Control | ME6012 | 30 | C | Laboratory & assignment reports | N/A | 30 | W | 3 hrs. | 70 |
| 6 | Individual Project (BEng/MEng) | ME6014 | 30 | C | Individual oral & written report plus poster | 10,000 | 90 | P | 0.33 hrs. | 10 |
| 6 | Automotive Systems Design and Analysis | ME6021 | 30 | C | Laboratory & assignment reports & final exam | N/A | 40 | W | 3 hrs. | 60 |
| 6 | Race Vehicles Design and Optimization | ME6051 | 30 | C | Laboratory & assignment reports & final exam | N/A | 40 | W | 3 hrs. | 60 |

**Key**

Type: W: written examination

P: practical

**Technical Annex**

|  |  |
| --- | --- |
| **Final Award(s):** | BEng (Hons) Automotive Engineering  BEng (Hons) Automotive Engineering (Motorsport) |
| **Intermediate Award(s):** | Cert HE in Automotive Engineering  Dip HE in Automotive Engineering  BEng Automotive Engineering |
| **Minimum period of registration:** | FT – 3 years  SW – 4 years  PT – 6 years |
| **Maximum period of registration:** | FT – 6 years  SW – 8 years  PT – 12 years |
| **FHEQ Level for the Final Award:** | Level 6 |
| **QAA Subject Benchmark:** | Engineering |
| **Modes of Delivery:** | Full-time, Sandwich and Part-time |
| **Language of Delivery:** | English |
| **Faculty:** | Engineering, Computing and the Environment |
| **School:** | Mechanical and Automotive Engineering (MAE) |
| **JACS code:** | H330 |
| **UCAS Code:** | H313 BEng (Hons) Automotive Engineering (FT, PT)  H312 BEng (Hons) Automotive Engineering (SW)  H100 BEng (Hons) Automotive Engineering  (Motorsport) (FT, PT)  HC4R BEng (Hons) Automotive Engineering  (Motorsport) (SW) |
| **Course Code:** | UFAUB1AUB09BU01  USAUB1AUB06BU01  UFAUB1AUB01BU01  USAUB1AUB05BU01 |
| **Route Code:** | UFAUB1AUB09  USAUB1AUB06  UFAUB1AUB01  USAUB1AUB05 |
|  |  |

Key:

ica = in-course assessment

ex = examination

prac ex = practical exam

**BEng (Hons) in Automotive Engineering – Course Structure**

**LEVEL 4**

**LEVEL 5**

**LEVEL 6**

**Industrial Placement**

Analytical Methods, Computing, Electrical & Electronic Systems

ME4012

100% ica

Engineering Design, Materials & Manufacture 1

ME4013

70% ica 30% ex

Thermofluid & Mechanical Systems 1

ME4011

40% ica 60% ex

Engineering Application and Practice

ME4010

100% ica

Project Engineering & Management

ME5014

40% ica 60% ex

Automotive Dynamics and Control Systems

ME5021

40% ica 60% ex

Engineering Design, Materials & Manufacture 2

ME5013

100% ica

Electronic Systems, Control & Computing

ME5012

50% prac ex 50% ex

Individual Project (BEng/MEng)

ME6014

90% ica 10% prac ex

Automotive Systems Design and Analysis

ME6021

40% ica 60% ex

Mechatronics, Dynamics & Control

ME6012

30% ica 70% ex

Business Management &

Quality Systems

ME6010

50% ica 50% ex

Key:

ica = in-course assessment

ex = examination

prac ex = practical exam

**BEng (Hons) in Automotive Engineering (Motorsport) – Course Structure**

**LEVEL 4**

**LEVEL 5**

**LEVEL 6**

**Industrial Placement**

Analytical Methods, Computing, Electrical & Electronic Systems

ME4012

100% ica

Engineering Design, Materials & Manufacture 1

ME4013

70% ica 30% ex

Thermofluid & Mechanical Systems 1

ME4011

40% ica 60% ex

Engineering Application and Practice

ME4010

100% ica

Project Engineering & Management

ME5014

40% ica 60% ex

Engine and Vehicle Principles

ME5051

40% ica 60% ex

Engineering Design, Materials & Manufacture 2

ME5013

100% ica

Electronic Systems, Control & Computing

ME5012

50% prac ex 50% ex

Individual Project (BEng/MEng)

ME6014

90% ica 10% prac ex

Race Vehicles Design and Optimization

ME6051

40% ica 60% ex

Mechatronics, Dynamics & Control

ME6012

30% ica 70% ex

Business Management &

Quality Systems

ME6010

50% ica 50% ex