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**Programme Specification**

**Title of Course: MSc Aerospace Engineering**

**Date Specification Produced: October 2012**

**Date Specification Last Revised: 12 Sep 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:** | MSc Aerospace Engineering |
| **Awarding Institution:** | Kingston University |
| **Teaching Institution:** | Kingston University |
| **Location:** | Roehampton Vale |
| **Programme Accredited by:** | Royal Aeronautical Society in May 2014 |

**SECTION2: THE PROGRAMME**

1. **Programme Introduction**

This programme is designed to broaden and deepen students’ knowledge of the aerospace industry and gain a strategic overview of aerospace engineering and management issues. It will help students to develop a wider perspective and understanding of the concerns facing the aerospace engineering industry, and includes subjects such as entrepreneurship, business, finance, research techniques and green environmental issues. Students will gain a broad understanding of the practical requirements of aerospace engineering, as well as knowledge of the subjects that are specific to aerospace engineering, such as modules in Aerospace Stress Analysis and Advanced Materials, Computational Fluid Dynamics (CFD) for Aerospace Applications and an Aerospace Group Design Project.(or individual project) They will also study subjects that are complementary to their academic discipline: Engineering Projects & Risk Management, Advanced CAD/CAM, and Green Engineering and Energy Efficiency. Engineering Research Techniques, Entrepreneurship and Quality Management is a core module of this course. It develops students’ business and management skills, and the skills to conduct a research project.

A substantial thesis is a core element for the group design or individual project which provides students the challenge of undertaking a real-world problem in an engineering environment. They will be encouraged to develop their research skills, self-initiative and problem-solving skills with the awareness of the real industrial constraints.. The group work or individual project also allows students to apply what they learn from the taught modules to real-world contexts, to evaluate methodologies and to develop their critical thinking and creativity. Students will develop the ability to show originality in the application of knowledge and to advance their knowledge through research. Our postgraduates will gain professional, analytical and management skills necessary for employment. Transferable skills such as communication, IT, teamwork, planning, decision-making, independent learning ability and problem-solving will contribute to their employability skills.

Kingston University is the biggest provider of undergraduate Aerospace Engineering courses in the UK. Kingston upon Thames has a strong historical heritage linking to Sopwith Aviation. The Hawker factory produced legendary aircraft including the Sopwith Camel and Hawker Hurricane. There is a strong link between our academic staff research and teaching. Our teaching teams have been actively involved in the research of computational fluid dynamic, aerodynamics and advanced materials. The University has well-equipped laboratories including two teaching flight simulators, a Learjet business aircraft, large scale low-speed wind tunnels, materials testing, rapid prototyping and high performance computing facilities.

The programme also helps develop employment-ready students through an integrated industrial experience in the form of a work placement on the two-year version of the programme.

This integrated placement provides students with an exciting opportunity to apply and develop their knowledge and skills in a real-world setting, which enables them to develop their self-confidence. Students undertaking such placement activities are in a stronger position to gain the skills and experience that employers desire today.

1. **Aims of the Programme**

#### The main aims of MSc Aerospace Engineering course are to:

* Provide a “period of further learning” which is a requirement of the Royal Aeronautical Society for Chartered Engineer status for students with an accredited BEng.
* Further the students’ knowledge and understanding of subjects within the broad areas of materials, computational aerodynamics, structures and aerospace design.
* Enable students to develop a wider perspective and understanding of the issues facing the aerospace engineering industries and in particular to study subjects such as business, finance, management, environmental issues more broadly and in greater depth than in the BEng (Hons) programme.
* Develop an awareness of work in a multi-disciplinary team within an engineering organisation within real industrial constraints.
* Demonstrate a range of transferable skills including written, oral and graphical communication, independent learning, analytical skills, and engineering based computing skills.
* To develop research and investigative skills, and a critical, research-oriented approach to the study of relevant areas of aerospace engineering.
* Give students on the 2 year version an opportunity to develop further skills, preparing them for higher levels of employment

The aims of the Postgraduate Diploma and the Postgraduate Certificate are the same as those for the MSc except that, since the PgDip and PgCert student is not required to submit a project, he/she will not have the same opportunity to engage in the in-depth research which the Dissertation requires. The PG Diploma or PG Certificate will not satisfy the requirements for a “period of further learning”.

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 master’s level 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 – able to:**  **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 aerospace engineering subjects. | B1 | Submit areas studied to critical analysis and evaluation | | C1 | Select and apply computer-based and other advanced technologies to a wide range of aerospace engineering applications |
| A2 | Apply modelling techniques and analytical methods to solve engineering problems. | B2 | Analyse problems and issues, taking due account of any incompleteness of data or information, and arrive at well-reasoned and supportable conclusions | | C2 | Select and use appropriate software tools for the design and analysis of aerospace components and systems. |
| A3 | Demonstrate applications of design principles and analysis tools to solve aircraft design problems. | B3 | Carry out independent data collection and synthesise it so as to resolve problems/issues | | C3 | Demonstrate an in-depth understanding of the aerospace engineering business environment, including legal aspects, and apply modern operations and financial management techniques and good practices in a range of contexts. |
| A4 | Demonstrate knowledge of entrepreneurship, management and environmental issues in engineering. | B4 | Design and develop a programme of independent research and data collection/analysis | |  |  |
| A5 | Demonstrate a range of engineering skills. | B5 | Carry out a focused critical literature review | |  |  |
|  |  | B6 | Develop original thought | |  |  |
| **Key Skills** | | | | | | |
|  | **Self Awareness Skills** |  | **Communication Skills** | |  | **Interpersonal Skills** |
| AK1 | Take responsibility for own learning and plan for and record own personal development | BK1 | Express ideas clearly and unambiguously in writing and the spoken work | | CK1 | Work well with others in a group or team |
| AK2 | Recognise own academic strengths and weaknesses, reflect on performance and progress and respond to feedback | BK2 | Present, challenge and defend ideas and results effectively orally and in writing | | CK2 | Work flexibly and respond to change |
| AK3 | Organise self effectively, agreeing and setting realistic targets, accessing support where appropriate and managing time to achieve targets | BK3 | Actively listen and respond appropriately to ideas of others | | CK3 | Discuss and debate with others and make concession to reach agreement |
| AK4 | Work effectively with limited supervision in unfamiliar contexts |  |  | | CK4 | Give, accept and respond to constructive feedback |
|  |  |  |  | | CK5 | Show sensitivity and respect for diverse values and beliefs |
|  | **Research and information Literacy Skills** |  | **Numeracy Skills** | |  | **Management & Leadership Skills** |
| DK1 | Search for and select relevant sources of information | EK1 | Collect data from primary and secondary sources and use appropriate methods to manipulate and analyse this data | | FK1 | Determine the scope of a task (or project) |
| DK2 | Critically evaluate information and use it appropriately | EK2 | Present and record data in appropriate formats | | FK2 | Identify resources needed to undertake the task (or project) and to schedule and manage the resources |
| DK3 | Apply the ethical and legal requirements in both the access and use of information | EK3 | Interpret and evaluate data to inform and justify arguments | | FK3 | Evidence ability to successfully complete and evaluate a task (or project), revising the plan where necessary |
| DK4 | Accurately cite and reference information sources | EK4 | Be aware of issues of selection, accuracy and uncertainty in the collection and analysis of data | | FK4 | Motivate and direct others to enable an effective contribution from all participants |
| DK5 | Use software and IT technology as appropriate |  |  | |  |  |
|  | **Creativity and Problem Solving Skills** |  |  | |  |  |
| GK1 | Apply scientific and other knowledge to analyse and evaluate information and data and to find solutions to problems |  |  | |  |  |
| GK2 | Work with complex ideas and justify judgements made through effective use of evidence |  |  | |  |  |
| **Teaching/learning methods and strategies** | | | | | | |
| The range of learning and teaching strategies includes   * Formal lectures, * Laboratory and computing classes, * Seminars, * Group work, * Tutorial and blended learning. | | | | | | |
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| **Assessment strategies** | | | | | | |
| The assessment strategies employed in the Fields include the following:   * Written Examinations/Tests * Reports * Research Project * Oral presentations | | | | | | |
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1. **Entry Requirements**

**1. The minimum entry qualifications for the field are:**

Applicants for the MSc are normally required to have a good honours degree (2.2) or academic equivalent, in aerospace engineering or a related discipline (such as aircraft or mechanical engineering).

**2. Typical entry qualifications set for entrants to the field are:**

Applicants for the MSc for all fields should normally have a good honours degree accredited in partial fulfilment of the academic requirements for Chartered Engineering Status

Any other student admitted joining the course would normally have a minimum 2.2 honours or academic equivalent, with some working experience in the industry.

Kingston University overseas students are currently required to have the following minimum English language standard:

• IELTS = 6.5 overall or above or in total, with 5.5 in reading and 6.0 in writing, 5.5 in speaking and listening

• TOEFL = 88, with 20/30 in speaking, reading and writing, 17/30 in listening.

• Pearson Test of English = 61 with 56 in reading and writing, 51 in speaking and listening

For further information, including other acceptable qualifications (such as WAEC and NECO from Nigeria and Ghana, and Indian CBSE) and pre-sessional English courses; see the KU website:

<http://www.kingston.ac.uk/international/studying-at-kingston/language-requirements/>

1. **Programme Structure**

This programme is offered in full-time/part-time mode, and leads to the award of MSc Aerospace Engineering. Entry is normally at level 7 with a first degree or equivalent qualifications (See section D). The course features two intakes per year (September and January) and the academic year is divided into two semesters, plus the summer period from May until the end of September, which is normally spent on a project. Taught modules consist of core and optional modules, which are delivered in week-block mode.

**E1. Professional and Statutory Regulatory Bodies**

Royal Aeronautical Society

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

The full-time course is an intense 12 month programme which does not allow for work placements within the course. However, the programme can be undertaken on a part-time basis which enables students to reflect upon their own personal experience of working in an applied setting, to focus on aspects of this experience so that they can clearly relate to theoretical concepts and to evaluate the relationship between theory and practice.

The 2-year version of the programme is designed to include work-based learning through assessments and the reflective report. Many of the students on the programme are already working and they can use that experience to relate to theoretical concepts and to evaluate the relationship between theory and practice.

While it is the responsibility of individual students to secure such placements, the Careers and Employability Service support offers each student support at all stages of the application process, including writing CVs, completing application forms, participating in mock interviews, assessment centre activities and psychometric tests. The process of applying for a placement gives students the opportunity to experience a real-life, competitive job application process.

The business experience period enables students to apply their learning in the real-world work environment, to reflect upon their own personal experience of working in course to theoretical concepts and to evaluate the relationship between theory and practice. Students will be assessed during and at the end of this period, normally through a portfolio. This will be marked as pass/fail.

Students who undertake work-based placements often benefit greatly from the experience, gaining real experience and work achievements

**E3. Outline Programme Structure**

This field is part of the University’s Postgraduate Framework. Single modules in the framework are valued at 30 credits and the field may contain a number of multiple modules. The minimum requirement for a Postgraduate Certificate is 60 credits, for a Postgraduate Diploma 120 credits and a Masters degree 180 credits. In some instances the Certificate or Diploma may be the final award and Certificates and Diplomas may be offered to students who only complete specified parts of a Masters degree. All students will be provided with the appropriate regulations.

. Students will work on the placement for between 10 – 12 months, after completing their dissertation. Students must confirm their placement by the deadline specified by the Faculty. The suitability of the placement requires approval of the Course Leader.

Students on placement must complete a portfolio assessment which includes a reflection on how the theories they have learnt during their teaching year have helped them in their placement and demonstrate ability to apply their teaching in a real-world situation.

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| **Level 7** | | | | | | | | |
| **Compulsory modules** | **Module code** | **Credit**  **Value** | **Level** | **%**  **Written exam** | **% practical exam** | **%**  **course-work** | **Teaching Block** |  |
| **Engineering Research Techniques, Entrepreneurship and Quality Management** | ME7711 | 30 | 7 | 0 | 0 | 100 | 1&2 |  |
| **Computational Fluid Dynamics for Aerospace Applications** | AE7724 | 30 | 7 | 0 | 0 | 100 | 1 |  |
| **Aerospace Stress Analysis and Advanced Materials** | AE7723 | 30 | 7 | 50 | 0 | 50 | 2 |  |
| **Aerospace Group Design Project or Engineering individual Project** | AE7720 ME7761 | 60 | 7 | 0 | 0 | 100 | 2 |  |
| **Option modules** |  |  |  |  |  |  |  | **Pre-requisites** |
| **Engineering Projects & Risk Management** | ME7712 | 30 | 7 | 0 | 0 | 100 | 1&2 |  |
| **Green Engineering and Energy Efficiency** | ME7725 | 30 | 7 | 0 | 0 | 100 | 1& 2 |  |
| **Advanced CAD/CAM** | ME7722 | 30 | 7 | 0 | 0 | 100 | 1&2 |  |
| **Professional Placement** | CI7900 | 120 |  |  |  |  |  |  |
| Students exiting the programme with 60 credits are eligible for the award of PgCert  Students exiting the programme with 120 credits are eligible for the award of PgDip | | | | | | | | |

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

The principles of teaching, learning and assessment are in line with the University's strategy, 'Led by Learning'. The fields are designed to give students a balanced portfolio of theoretical and practical experience, embracing diversity and individuality.

Taught materials and knowledge gained from the practical and case studies embedded within each module give students specialised knowledge, tools and techniques. It will equip them with the skills and methods for extracting and synthesising the information. These activities promote rigour, curiosity, excellence, originality and breadth of knowledge.

They must then further explore and exploit the information given, research and define outcomes accurately to produce detailed solutions and innovative work for each module and project dissertation.

It is recognised that teamwork is a very important aspect in the industry and this is implemented in the modules. The course ensures that the students are exposed to team working through group presentations, joint report writing, joint research and lab work, promoting consideration, courtesy and collegiality.

The course teams are aware of the need for effective communication, both written and verbal, and take pride in the fact that the courses provide, in this regard, a means of preparing the students for their longerterm career plans and Continuous Professional Development (CPD.) Apart from the project itself, each student has to deliver verbal presentations during the modules, normally to the student’s peer group and module leader. Students are also helped with verbal communication skills through seminars, tutorials and discussion groups. Most modules are assessed by written assignments which are designed to improve students’ research and evaluation skills.

A combination of assessment methods will be used throughout the course. These elements include module assignments, module examinations, in-class tests, experiment reports, industrial visit reports, seminars, verbal presentations and the project dissertation. Each module leader is responsible for ensuring that the method of assessment reflects the aims and learning objectives of the module, is demanding and stimulating and at the appropriate Master level. The level and content of courses are relevant and satisfy the Engineering Council's guidance and criteria.

The course uses formative assessment opportunities to provide students with essential feedback. Early feedback can help students to improve their motivation and academic performance. This teaching and learning strategy is implemented through small group tutorials, seminars, group feedback sessions, draft reports with intermediate feedback, peer assessment in group work, project plans, reflective blogs and face-to-face meetings with supervisor.

The programme embraces the use of Technology Enhanced Learning (TEL) to engage students actively. Some of the most widely used technologies in problem-solving activities are computer simulations and modelling which encompass Finite Elements Analysis (FEA), Computational Fluid Dynamics (CFD), Computer Aided Design (CAD) in the curriculum. Digital tools such as a team’s work file syncs DropBox, cloud-based project management tool Gantter, Tumblr Aerospace blog, Facebook study group, VLE assessment and YouTube videos are used to enhance the quality of student learning experience.

Research Informed Teaching (RIT) is an important component of our commitment to academic excellence by bringing the findings from staff research into the curriculum contents and using assignments which involve elements of research processes. The curriculum is designed around inquiry-based activities where students can explore their research aspirations and propose new hypotheses. They also learn about the latest staff research findings from lectures within the modules such as Aerospace Stress Analysis and Advanced Materials, Computational Fluid Dynamics for Aerospace Applications, Finite Element Analysis and experimental studies of aerospace composite materials, Large Eddies Simulations of complex and compressible turbulent flows, fire simulation, drag reduction using Nano paint coating, and prediction of turbulent transition of wavy boundary layers.

**Engineering curriculum**

The **Engineering Research Techniques, Entrepreneurship and Quality Management ME7711** introduces the students the skills to conduct a research project and develop their knowledge and skills in business and management, with emphasis on entrepreneurship and innovation in products or services. They will develop the analytical skills to solve business and management problems in an engineering environment. It will ensure students to have an awareness of the ethical, legal, social and economic implication in a broader context. The module provides the knowledge and understanding of the Total Quality Management in the engineering environment.

The **Computational Fluid Dynamics for Aerospace Applications AE7724** is designed to provide students with computational skills to enhance their employability in the engineering sector. They will acquire the knowledge and skills in computational fluid dynamics and the advanced mathematics governing the flow problems. They will be able to interpret, evaluate and apply the results of the computational analysis and modelling in order to make aerodynamic improvement of engineering components.

The **Aerospace Stress Analysis & Advanced Materials AE7723** focuses on the analytical techniques of modern materials and structures and their advanced manufacturing process. The computational technique finite element methods will be introduced to evaluate the structural performance of an engineering design. Students will assess aspects of quality assurance to advanced materials with an awareness of the economic constraints.

Students will have the option of doing either an individual or group project. The **Aerospace Design Project Dissertation AE7720** provides a challenge to the students working as a multidisciplinary team that has to design an aircraft meet a set of specifications and real-world constraints. The **Engineering Individual project ME7761** provides the students a challenge to identify an industry based (or research focused) project area, establish a feasible hypothesis, find creditable solutions, analyse results and offer recommendations. The theme of the project is an open-ended problem with lots of uncertainties, demanding research, analyses, and design optimisation. Students will develop the understanding of the process and methodologies underpinning aircraft design. The design solutions will be critically evaluated by theoretical analyses, computer-based modelling and experimental testing techniques. They will develop awareness for the latest innovation, cost, sustainability and environmental issues, such as engine noise emission, carbon foot prints, aerodynamic and fuel efficiency. Students are made aware of the regulatory requirements from the civil aviation regulatory bodies. The part-time students can choose their own individual projects with themes usually relevant to their full-time engineering jobs.

The **Engineering Projects and Risk Management ME7712** covers thecomprehensive knowledge and understanding of the techniques and skills required in project management with an engineering environment. Students will be equipped with the ability to identify commercial risks and appraise the opportunities. They will analyse the cause of failures and success of real projects through the case studies. The module introduces project management modelling approaches and software tool to produce an effective project framework.

The **Advanced CAD/CAM ME7722** develops students’ knowledge and understanding of the advanced CAD/CAM techniques in conceptual design and manufacturing process. The module focuses on surface modelling, reverse engineering, machining operations simulation and rapid manufacturing methods. Students will have to analyse critically and optimise the machining operation using the leading industrial CAD/CAM package.

The **Green Engineering & Energy Efficiency ME7725** is designed to provide knowledge and understanding of sustainable development in the engineering environment. The module will equip the students the skills and the ability to apply quantitative techniques in order to enhance energy efficiency and minimise the environmental impact or risk of the products and operations. It provides an understanding of energy efficient code, product life cycle and the sustainability context taking account of the environmental, social and economic considerations. The module will develop their ability to synthesize and evaluate design solutions are energy efficient and environmentally friendly.

The **Professional Placement CI7900 i**s the core module of the two-year work-based learning. Students will spend a minimum of 10 months and a maximum of 12 months working in an engineering environment. It provides students with the opportunities to apply and gain both the engineering and general skills in a work environment. They will develop a wide range of engineering practice abilities, graduate attributes and employability skills such as interpersonal, communication, team-working, management and leadership skills. Students are required to keep a reflective log that will enable them to reflect on their experiences and improve their performance encouraging Continuous Professional Development CPD.

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

Students are supported by:

* A Module Leader for each module
* A Course Leader to help students understand the programme structure
* Personal Tutors to provide academic and personal support
* A placement tutor to give general advice on placements
* Technical support to advise students on IT and the use of software
* A designated programme administrator
* An induction week at the beginning of each new academic session
* Staff Student Consultative Committee
* Canvas – a versatile on-line interactive ~~intranet an~~ a Virtual Learning Environment (VLE)
* A substantial Study Skills Centre that provides academic skills support
* Student support facilities that provide advice on issues such as finance, regulations, legal matters, accommodation, international student support etc.
* Disabled student support
* The Students’ Union
* Careers and Employability Service

At level 7, the course leader or group project supervisor acts as the personal tutor throughout their course. The Personal Tutor Scheme (PTS) is embedded in the provision through one-to-one and group meetings with the Course Leader. It aims to help students to make the transition to Master’s degree level and to encourage them in fulfilling their academic /research aspirations. The first group meeting will last half an hour during the induction week. It will be followed by several sessions of one-to-one meetings lasting about 15 minutes. The project supervisor will also see students weekly during the group project meetings over the summer period that provides plenty of opportunities for face-to-face contact. For the part-time level students, one-by-one contacts can be conducted by emails or by phone. A personal tutor will act as the default referee and encourage students to keep in touch.

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**

Students who successfully complete the MSc will have acquired significant research, analytical and transferable skills in the broader issues relating to aerospace engineering and should therefore have substantially enhanced their prospects of gaining employment and progressing their career in the aerospace industry. They will have a systematic understanding of knowledge in subjects that are both specific and complementary to aerospace engineering. The programme is built on a comprehensive application of techniques such as advanced computer-based design, Computational Fluid Dynamics (CFD) and Finite Elements Analysis (FEA). It enables students to also gain management and business skills necessary for employment.

The group design project provides a challenge to the candidates to undertake a real-world problem because most projects are industrially orientated in a virtual environment. During the project students will be expected to apply the knowledge and skills learnt during the course to achieve agreed deliverables, whilst satisfying any given constraints and demonstrating originality in solving problems. They will have to demonstrate the exercise of initiative and personal responsibility. Key skills in communication, presentation, research, problem analysis, project planning, decision making and solution justification are all part of the learning objectives defined in the field which fosters the development of their employability skills.

Postgraduates of this course have taken up posts in a variety of employment settings including CAA, Rolls Royce, Sterling Aerospace, Marshall Aerospace, The Royal Navy, Pall Europe, Amsafe, Armour, Solion Solar Energy, EasyJet, Lufthansa, Flybe, Hawkerhind and Precision Press Parts Corp. Some postgraduates have continued their studies in PhD research projects. The employability skills taught in the course are outlined in section F.

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

There is no variant to the PCF.

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

Engineering Council UK-SPEC:

<https://www.engc.org.uk/ukspec>

Royal Aeronautical society Accreditation Handbook:

<https://www.aerosociety.com/media/4238/membershiphandbook.pdf>

Kingston University Web site:

<http://www.kingston.ac.uk/postgraduate-course/aerospace-engineering-msc/>

**Development of Programme Learning Outcomes in Modules**

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

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|  |  |  | **Level 7** | | | | | | |
|  | **Module Code** |  | ME7711 | AE7724 | AE7723 | AE7720  ME7761 | ME7712 | ME7725 | ME7722 |
| **Programme Learning Outcomes** | **Knowledge & Understanding** | A1 |  | S | S | S |  |  |  |
| A2 | F/S | S | S | S/F |  | S | S |
| A3 |  | S/F | S/F | S/F |  |  |  |
| A4 | S | F | F | F/S | F | F/S |  |
| A5 | F/S | F | F | F | S | F/S | F |
| **Intellectual Skills** | B1 | S | S | S | S | S | S | S |
| B2 | S | S | S | S | S | S | S |
| B3 | S/F | S | S | S | S | S | S |
| B4 | F | F | F | S/F | F | S/F | S |
| B5 | S/F | F | F | S | S | S |  |
| B6 | F | F | F | F | F | S/F | S |
| **Practical Skills** | C1 | F | F | F | S/F |  | S | S |
| C2 | F | S | S | S | S | S | S |
| C3 | S |  |  | F |  |  |  |
| **Self Awareness Skills** | AK1 | F | F | F | F | F | F | S |
| AK2 |  | F | F | F | F | F | S |
| AK3 | S/F | F | F | F | S | S/F | S |
| Ak4 | S/F | F | F | F/S | F | S/F | F |

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

**F** where formative assessment/feedback occurs.

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|  |  |  | **Level 7** | | | | | | |
|  | **Module Code** |  | ME7711 | AE7724 | AE7723 | AE7720 ME7761 | ME7712 | ME7725 | ME7722 |
| **Programme Learning Outcomes** | **Communication Skills** | BK1 | S | F | S | S | S | S | S |
| BK2 | S | F | S | S | S | S | S |
| BK3 | F | S | F | F/S | F/S | F | F |
| **Interpersonal Skills** | CK1 | F | F | F | F/S | S | F/S | S |
| CK2 | F | F | F | F | F | F/S | F |
| CK3 | F | F | S | F/S | F | F/S | F |
| CK4 | F | F | F | F | F | F/s | F |
| CK5 | F | F | F | F | F | F/S | F |
| **Research and information Skills** | DK1 | S | S | F | F/S | S | F/S | S |
| DK2 | S | S | F | F/S | S | S | S |
| DK3 | S |  |  |  | S | S |  |
| DK4 | S | S | S | S | S | S | S |
| **Numeracy Skills** | EK1 | F | F | F | F/S | S/F | S/F | F |
| EK2 | F | S | S | S | S/F | S/F | F |
| EK3 | F | S | S | S | S/F | S/F | F |
| Ek4 |  | S | S | S | S/F | S/F | F |
| **Management & Leadership Skills** | FK1 | F/S | F |  | F | S | S | S |
| FK2 | F/S | F |  | F | S | S | S |
| FK3 | F | F | S | S | S | S | S |
| FK4 |  | S |  | F | F | F | F |
| **Creativity & Problem Solving Skills** | GK1 |  | F | S | S | F | S | S |
| GK2 |  | F | S | S | F | S | S |

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

**F** where formative assessment/feedback occurs.

**Appendix 3 MSc Aerospace Engineering (with Professional Placement) Structure**

**Modules - 90 Credits**

**ME7711**

**Engineering Research Techniques, Entrepreneurship and Quality Management**

**30 Credits**

**AE7724**

**Computational Fluid Dynamics for Aerospace Applications**

**30 Credits**

**AE7723Aerospace Stress Analysis and Advanced Materials**

**30 Credits**

**Project - 60 Credits**

**AE7720 or ME7761**

**Aerospace Group Design Project or Engineering Individual Project**

**60 Credits**

**Optional Modules - 30 Credits**

**ME7712**

**Engineering Projects & Risk Management**

**30 Credits**

**ME7722**

**Advanced CAD/CAM**

**30 Credits**

**ME7725**

**Green engineering and Energy Efficiency**

**30 Credits**

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**Technical Annex**

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| **Final Award(s):** | MSc |
| **Intermediate Award(s):** | PgDip, PgCert |
| **Minimum period of registration:** | 1 year FT (or 2 years with Professional Placement) and 2 years PT |
| **Maximum period of registration:** | 2 year FT (or 3 years with Professional Placement) and 4 years PT |
| **FHEQ Level for the Final Award:** | MSc |
| **QAA Subject Benchmark:** | Engineering |
| **Modes of Delivery:** | FT, FT with placement and PT |
| **Language of Delivery:** | English |
| **Faculty:** | SEC |
| **School:** | Engineering and the Environment |
| **JACS code:** |  |
| **UCAS Code:** | N/A |
| **Course Code:** | PFAEN1AEN99 |
| **Route Code:** | G40620 |
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