Template C4

Kingston University London

Programme Specification

Title of Course: *FdEng Aircraft Engineering*

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Version number	5
Faculty	Faculty of Engineering, Computing and the Environment
School	School of Engineering
Department	Department of Aerospace and Aircraft Engineering
Delivery Institution	Exeter College

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

SECTION 1: GENERAL INFORMATION

Award(s) and Title(s): ***Up to 10 pathways***	FdEng Aircraft Engineering
Intermediate Awards(s) and Title(s): ***There are 4 Intermediate awards for each pathway***	CertHE Aircraft Engineering (120 credits at level 4)
Course Code ***For each pathway and mode of delivery***	UPAAE1AAE01 UOAAE1AAE70
UCAS code ***For each pathway***	H410

RQF Level for the Final Award:	5
Awarding Institution:	Kingston University
Teaching Institution:	Exeter College
Location:	Exeter College
Language of Delivery:	English (at all delivery sites)
Modes of Delivery:	Part-time Full-time
Available as:	Full field
Minimum period of registration:	Part-time - Full-time -
Maximum period of registration:	Part-time - Full-time -
Entry Requirements:	The minimum standard entry qualifications for the programme are: • 96 UCAS tariff points from three A-levels to include Mathematics and Science (General Studies and native language A-levels are not accepted) • 96 UCAS tariff points from a BTEC Extended Diploma (180-credit award) in an engineering subject to include Further Mathematics for Engineering Technicians. (BTECs in computing or technology subjects are not accepted). • HE access course with 60 credits at level 3 in an engineering subject. Plus: • Five GCSEs grade A*to C which must include English Language, Mathematics and a science or technology subject. Native language GCSEs, Key Skills Level 2 Communication and

	Application of Numbers, and IGCSE English as a Second Language are not accepted. Applicants with military and/or civil aircraft maintenance engineering experience or who have completed vocational aircraft engineering courses will be considered on an individual basis. 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.
Programme Accredited by:	Partially by Royal Aero. Full IEng upon completion of BEng Aircraft Top up.
QAA Subject Benchmark Statements:	Engineering
Approved Variants:	None.
Is this Higher or Degree Apprenticeship course?	

For Higher or Degree Apprenticeship proposals only	
Higher or Degree Apprenticeship standard:	n/a
Recruitment, Selection and Admission process:	n/a
End Point Assessment Organisation(s):	n/a

SECTION 2: THE COURSE

A. Aims of the Course

The aims of the programme are to:

- Produce aircraft maintenance engineers who are equipped with the technical knowledge, understanding and skills to succeed in the industry and who also have the underpinning academic knowledge, understanding and skills needed for progression to the BSc(Hons) Aircraft Engineering Top-Up programme.
- Provide students with the professional knowledge and skills that will enable them to manage their own personal and professional development, and encourage them to be proactive in their professional and personal development.

B. Intended Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding and intellectual and practical skills as shown below.
The programme also provides an opportunity for the students to develop and demonstrate the key skills shown in Table 2.
The programme outcomes are referenced to the QAA subject benchmark statement for engineering, the Framework for Higher Education Qualifications in England, Wales and Northern Ireland (2008) and the EC UK-SPEC Learning Outcomes, and relate to the typical student.

Professional Conduct – Aircraft Maintenance Engineering

Aircraft maintenance engineers are expected to demonstrate a high degree of self-discipline, integrity and respect for airworthiness. These characteristics can be summed-up in the term professional conduct. Students on this programme are aspiring to become aircraft maintenance engineers; engineers who will be responsible for the lives of hundreds of passengers and people on the ground. Therefore, by the time students complete this programme they will be expected to have a very good understanding of the standard of professional conduct required and be able to demonstrate that they can conduct themselves professionally in an aviation environment.
To some extent, development of professional conduct is embedded in the programme because the learning takes place in aviation authority approved training organisations and the staff delivering the programme are experienced in aircraft maintenance engineering. However, the requirement is too important to be left as embedded. Therefore, what is expected of the students, and what will be expected of them as aircraft engineers, will be explained during induction and in learning sessions associated with the first year skills module and developed in the other programme modules; especially the modules containing work-related learning such as laboratory exercises, hand-skills and maintenance activities. Linking the development of professional conduct to the work-related learning enables the skills to be developed simultaneously over the duration of the programme and will provide evidence of why a high degree of professional conduct is necessary.

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

Programme Learning Outcomes					
	Knowledge and Understanding On completion of the course students will be able to:		**Intellectual Skills** On completion of the course students will be able to		**Subject Practical Skills** On completion of the course students will be able to
A1	Apply their knowledge and understanding of essential facts, concepts, theories and principles associated with aircraft engineering and the underpinning mathematics and science.	B1	Analyse the operation of aircraft systems and equipment to support defect diagnosis and identification, and provide evidence of their analytical and evaluative capabilities.	C1	Work effectively and safely in an aircraft maintenance environment and demonstrate due regard for good working practices, the regulations under which they must work and fight safety.
A2	Demonstrate a knowledge and understanding of the subject matter of the European Aviation Safety Agency (EASA) Part-66 module syllabuses for the Category B1.1 aircraft maintenance engineering licence.	B2	Locate, select, interpret and evaluate data and use it effectively in communication having due regard for intellectual property rights.	C2	Perform scheduled and unscheduled maintenance, fault diagnosis and rectification and serviceability testing on aircraft systems using the documentation, tools and equipment necessary to complete the task.
A3	Demonstrate a knowledge and understanding of the responsibilities and legal obligations of licensed aircraft maintenance engineers and the effects of them exercising their engineering judgement.	B3	Communicate clearly and succinctly orally, graphically and in writing having due regard for the receiving audience.	C3	Use a range of IT resources for research and communication, to retrieve and store information and data, and to produce documents incorporating different types of information.
A4	Discuss the responsibilities of engineers in a broader context and explain the roles of the Engineering Council and Professional Engineering Institutes, and the process and purpose of registration.	B4	Reflect on their learning, identify strengths and weaknesses, determine priorities, set targets and develop action plans to meet them.	C4	Work independently or as a member of a team to achieve set goals.

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

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

C. Outline Programme Structure

The programme is offered in full-time mode only because of the desire to maintain the link with aviation authority approved aircraft maintenance engineering training and the benefits this affords students who successfully complete the course. However, it is possible to deliver the programme in part-time mode as a non-approved course with or without aviation authority examinations.

Entry to the programme is at year one with direct entry to year two only being considered under exceptional circumstances. Those wishing to obtain the benefits of completing an aviation authority approved course must complete the full programme irrespective of previous experience and or qualifications.

E1. Professional and Statutory Regulatory Bodies

The programme is accredited by the Royal Aeronautical Society as partially satisfying the educational requirements for registration as an Incorporated Engineer.

E2. Work-based learning, including sandwich programmes

This programme has been designed to cover the knowledge and skills requirements specified in the aviation industry's aircraft maintenance engineering training syllabus. Therefore, the whole of the programme is linked to the needs of the industry and standard working practices.

The programme has two modules that contain work based learning: AE4010 Aircraft Practical and He Study Skills and AE5010 Aircraft Maintenance and Professional Practice. Also, a number of other modules in the programme contain practical exercises and tasks that are work related. The work-based and work related activities completed in workshops and/or aircraft maintenance environment (simulated and/or real) integrate different disciplines and provide a real-world experience designed to prepare students for their expected future role as aircraft maintenance engineers.

AE4010 Aircraft Practical and He Study Skills introduces students to the hand-skills and fundamental maintenance activities that an aircraft maintenance engineer needs to be able to perform in order to fulfil their role. It is also intended to be delivered in such a way as to instil a responsible attitude towards aircraft maintenance and flight safety. The majority of this module is normally delivered in a workshop environment. Skills are demonstrated, then practiced and finally assessed. The various tasks each student completes are designed to develop the skills and improve their precision and accuracy.

AE5010 Aircraft Maintenance and Professional Practice contains a significant element of learning centred on aircraft maintenance skills; including fundamental defect identification, analysis and rectification. Students are normally introduced to maintenance tasks and activities in controlled environments then given the opportunity to develop the skills in real and/or simulated aircraft maintenance environments such as workshops, bays, stores and on aircraft in a hangar. To be given an opportunity to complete work experience alongside practising aircraft maintenance engineers in a live aircraft maintenance organisation, students will have to satisfy the requirements specified by the approved training organisation. Students will be apprised of the requirements at the start of the course and reminded of them during the course. The requirements will include passing certain key EASA examinations, being judged as sufficiently competent at hand skills and maintenance skills, demonstrating safe working practices in the controlled maintenance environment and satisfying a minimum attendance requirement.

If the programme is delivered under an aviation authority approval, it is not normally possible for students to take a year out for an industrial placement without losing the benefits associated with the completing the approved course.

E3. Outline Programme Structure

The Foundation Degree Aircraft Engineering is a two-year, full-time programme comprising 240 credits (2400 hours) of learning at FHEQ levels 4 and 5. 120 credits of learning are delivered each academic year and this is divided into four 30 credit modules. The modules delivered in each year of the programme can be seen in Tables 4 and 5 and details of each module can be found in the individual module descriptors available from the university website.

The programme is operated in accordance with the KU Undergraduate Regulations and modules are compulsory; there are no optional modules available. To be awarded an FdEng Aircraft Engineering, students must pass all 240 credits. A student is eligible for the award of a Certificate of Higher Education (CertHE) provided they successfully complete at least 120 credits of the programme at level 4 or above.

Students who successfully complete the FdEng can progress onto the BSc(Hons) Aircraft Engineering and to-up their award to an honours degree with a further one-year of full-time or two-years of part-time study.

FdEng Aircraft Engineering

Level 4							
FdEng Aircraft Engineering							
Core modules	**Module code**	**Credit Value**	**Level**	**Teaching Block**	**Pre-requisites**	**Full Time**	**Part Time**
Aerodynamics and Theory of Flight	AE4011	15	4	1	none	1	1
Aircraft Electronic and Digital Systems	AE4012	15	4	2	none	1	1
Aircraft Practical Hand Skills and Sustainability	AE4014	15	4	2	None	1	1

Electrical Engineering Fundamentals	AE4002	30	4	1&2			
Mathematics and Physics for Practitioner Engineers	AE4001	30	4	1			
Navigate for Aircraft Engineering	AE4015	15	4	1	none	1	1
Optional Modules							

Progression to Level 5

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

Level 5							
FdEng Aircraft Engineering							
Core modules	**Module code**	**Credit Value**	**Level**	**Teaching Block**	**Pre-requisites**	**Full Time**	**Part Time**
Aircraft Electrical & Avionics systems	AE5024	15	5	TB2		2	2
Aircraft Materials, Hardware and Maintenance	AE5001	30	5	1		2	2
Aircraft Structures and their Mechanical Systems	AE5032	15	5	1	none	2	2
Exploring Engineering Project Management	EG5016	15	5	TB1		2	2
Human factors and Aviation legislation	AE5033	15	5	2	none	2	2
Propulsion systems	AE5043	30	5	1 and 2	none	2	2
Optional Modules							

D. Principles of Teaching, Learning and Assessment

In the first year of the programme the fundamental mathematics, physics and electrical engineering needed to underpin further learning and understand the operation of aircraft equipment, systems and engines is delivered in a single module in teaching block one. This module is presented primarily as a series of lectures and tutorials. However, the electrical engineering element is supported by laboratory sessions that are intended to reinforce the theory taught in class, deepen the students'

understanding of the subject and introduce them to the components and equipment associated with this field of engineering. The" Aerodynamics and Aircraft Electronic and Digital Systems" module in teaching block two provides the students' with their first encounter with the aeroplane. The module is delivered primarily through lectures and tutorial sessions because a large proportion of the material is descriptive in nature. However, this module provides a very good opportunity to use media and IT, especially video, and students should find it informative and interesting because it is aircraft specific and not purely academic.

The workshop and hangar practice introduces and give students an opportunity to develop the practical and maintenance skills needed to be an aircraft engineer. The learning outcomes are achieved primarily through practical exercises. However, short teach-ins will be used to introduce students to the tools, equipment, materials and procedures prior to their use and to explain any safety matters. The complexity of the exercises and the standard of workmanship expected will increase as the student progresses through the series of exercises. Early exercises are normally used to learn and practice a skill and later exercises to develop a skill and for assessment purposes. Throughout the module students are given guidance and feedback on their workmanship and progress; the overall aim being to try to help and encourage the students to develop the skills to a "competent" level. This module will not turn students into skilled experts; students will require a lot more practice to achieve this. However, it will prepare students for the maintenance activities they complete in the second year of the programme.

The HE study skills will be delivered year-long because the skills need to be practised, developed and properly mastered; and this takes time. However, to ensure students are properly prepared and able to obtain the maximum benefit from the academic module, the teaching associated with it will be delivered in the early weeks of teaching block. Assessment of this material is 100% coursework and comprises a study journal and portfolio of evidence of achievement produced by the students. This is discussed in more detail below.

In the first year of the programme, 60% of the assessment is coursework and only 40% is summative-only examination. The summative examinations are used to assess the learning outcomes of the modules that have aviation authority assessment associated with them. Also, the material taught in these modules (Math, Physics , Electrical Engineering and aerodynamics) underpins the learning in several other modules in the programme both in year one and year two. It is, therefore, essential to ensure that student have a good grasp of this material before they progress to year two.

The second year builds on the fundamental knowledge and skills gained in the first year but the focus changes to aircraft. Three of the four modules are directly associated with aircraft and linked to EASA Part-66 modules. In these modules students study aircraft materials and hardware, airframe construction, aircraft systems and turbine engine. The fourth module: AE5010 is split into two elements, practical aircraft maintenance and professional practice which looks at human factors and its potential impact on flight safety and aviation legislation; and introduces students to the responsibilities of engineers in the broader context and the Engineering Council and Professional Engineering Institutes. The learning outcomes of the three aircraft theory modules are achieved primarily through lectures and in-class tutorial sessions. As in the first year, informal in-class tests, micro-teaches by students and tutorial questions will all be used to enable students to gauge their level of knowledge and understanding and staff to identify weaknesses and areas needing attention.

The aircraft maintenance, a significant element of AE5010, comprises practical exercises carried out in workshops and simulated and/or real maintenance environments. Students will normally be supervised whilst completing the activities and will receive feedback and advice on how they are performing and progressing. The amount of guidance given will depend on the task being carried out and the ability and confidence of the individual student. To pass the module, students will need to demonstrate that they are capable of performing typical aircraft maintenance activities competently and safely and with due regard to flight safety and the airworthiness of aircraft. It should be noted

that successful completion of this module will not turn students into maintenance “experts”; they will need to gain more experience and broaden and deepen their knowledge. However, the module will, however, give students a solid foundation on which to build.

Three modules in the second year have end-of-module examinations. Once again, the material in these modules is “must-know” and each module has EASA assessment associated with it. However, over 60% of the summative assessment in the year is coursework designed to help staff and students identify the topics and/or skills that need to be worked on.

ALL of the summative coursework completed in the both years of the programme is also formative. Students are told the marks they have been awarded and are given group and/or individual feedback within three weeks of taking an examination of submitting other assessment. The marks and feedback enable students to gauge their level of knowledge and understanding and manage their learning and development and prepare for the final examinations if applicable. The coursework also enables staff to gauge the progress of the students and identify strengths and weaknesses and individuals needing assistance.

Informal, formative assessment and a range of learning activities are used throughout both years of the programme to help develop the students’ knowledge and understanding and inform them of their progress. These activities also enable staff to gauge progress and direct learning. Activities employed include: informal in-class tests, micro-teaches, tutorial questions, discussion groups and short presentations. These types of activity are possible because aviation authority requirements limit the number of students in theory classes to 28 and the number in practical classes to 15 per member of staff. These restrictions on class sizes make the learning environment more akin to that found in a school or college rather than a university; although it must be noted that the programme does aim to develop the students’ ability to work and learn independently.

A study journal and portfolio of evidence of achievement are used for the assessment of the first year study skills module and the professional practice completed in the second year. The majority of material in these two documents will be linked to, or come from work completed for the other modules in the programme. However, students may be asked to produce some work specifically for the journal and/or portfolio. Students will be given a briefing on the requirements at the start of year one and a “contents specification” at the start of each academic year. Throughout the year, teaching teams, in particular the module leader(s), will review and discuss the contents of the documents and progress on them with students and provide additional written and/or oral feedback to individuals and/or groups as necessary.

Summative assessment of the study journal and portfolio will be based on two elements: satisfying a minimum contents requirement and the effort demonstrated in compiling the portfolio, and the overall quality of the material submitted. The assessment is intended to be rigorous but the primary focus of the module is on providing quality feedback to help the students to learn and develop academic and professional skills.

The study journal and portfolio can also be used to support the university’s Personal Tutor Scheme because it will provide personal tutors with a package of material that they can view and discuss with their tutees.

E. Support for Students and their Learning

The support provided to students is comprehensive but details vary between delivery sites. All students on all sites are supported by:

- An induction period at the beginning of the programme which includes briefings on the programme; university computer-based resources and university and local rules, regulations and procedures.
- A Course Leader and KU Liaison Officer based at Kingston and a Partner Liaison Officer employed by the partner and based at the partner site.
- A local Module Leader for each module who is responsible for managing the module and ensuring the coherence of the material and learning, and the fairness of the assessment. Local Module Leaders are supported by KU overarching Module Leaders who ensure comparability of the students learning, teaching and assessment experience at the module level across the consortium.
- A nominated personal tutor and the university Personal Tutor Scheme (PTS). Details of the scheme are available on the university website and will be explained to students during induction.
- Bi-annual Staff Student Consultative Committee meetings held at the partner organisations.
- Canvas – the university's on-line virtual learning environment.
- Access to e-resources from the KU Learning Resource Centres.
- A local programme administrator and a dedicated KU programme administrator.
- Student support departments that provide advice on issues such as finance, regulations, legal matters, accommodation, international student support etc.
- Access to technical support to provide students with advice on IT and the use of software.
- Disabled student support.
- The Students' Union.
- Careers and Employability Service.

F. Ensuring and Enhancing the Quality of the Course

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

- External Examiners.
- Boards of study.
- Annual review and development.
- Periodic reviews undertaken at subject level.
- Staff Student Consultative Committee (SSCC) meetings.
- Moderation and feedback policies.

SSCC meetings and local boards of study are held bi-annually at each partner site; normally in October/November (Teaching Block 1) and March/April (Teaching Block 2). Wherever possible, the meetings are scheduled to take place on the same day to minimise disruption to students and the programme. The boards are chaired by the Partner Liaison Officer (PLO) and attended by the University Liaison Officer (ULO), local staff involved in the management and delivery of the programme and student representatives from each intake of the programmes being delivered. The

local Boards of Study feed into the School of Aerospace and Aircraft Engineering Board of Study which in turn feeds into the Faculty Board.

In addition to the SSCCs and Boards of Study, an annual Aircraft Collaborative Partnership meeting is scheduled to take place in July of each year at Kingston. The meeting, hosted by the Field Leader, is intended to provide a platform for staff from different sites to meet to discuss inter-partner matters and disseminate good practice; it also provides an opportunity to carry out collective staff development.

Partial Incorporated Engineer accreditation for the programme will be sought from the Royal Aeronautical Society once the course has been validated. And, full accreditation will be sought for the combination of this programme and the BSc(Hons) Top-Up Aircraft Engineering programme. To be accredited, a programme must satisfy the Engineering Council's and the Society's requirements. The process, carried out by a panel from the Society, involves:

- An in-depth review of all programme documentation.
- A review of marketing material; the student selection and admission policies and processes, and the progression and award statistics.
- Visits to all sites delivering the programme to assess the learning environment and review resources.
- Meetings with KU and partner staff involved in the delivery of the programme and private meetings with students on the programme.
- Confirmation that the programme satisfies the UK Standard for Professional Engineering Competence (UK-SPEC) general and specific learning outcomes.

Re-accreditation of programmes normally takes place every five years.

G. Employability and work-based learning

Over the past 20 years there has been exponential growth in the air transport industry and the need for aircraft maintenance engineers and other operational staff and no growth in training capacity. The outcome of this mismatch is a shortage of graduate-calibre aircraft maintenance engineers; a shortage that, according to a recent International Civil Aviation Organization (ICAO) study, is unlikely to be easily cleared. The study, published in March 2011, estimated that between 2010 and 2030 there will be a shortfall of training capacity equivalent to 360,000 aircraft maintenance engineers. This is shortfall of approximately 18,000 training places and, consequently 18,000 engineers per year. This means the job prospects and career opportunities for anybody with a qualification in aircraft maintenance engineering should be extremely good now and in the future.

This programme is designed to produce aircraft maintenance engineers. This has been achieved by combining the technical knowledge and skills needed to become a licensed aircraft maintenance engineer with academic knowledge and skills and by providing students with opportunities to develop the professional and personal qualities needed to succeed.

The programme is based on the Aircraft Engineering Foundation Degree (FD) that KU delivered for 13 years from 2001 to 2013. The FD was designed in partnerships with KLM UK Engineering to ensure it would meet industry needs and could be delivered as an approved course by EASA Part-147 approved Maintenance Training Organisations (MTOs). KLM helped to design this new programme, continue to partner KU in its delivery and, together with our other Part-147 approved partners, will help to ensure the course continues to satisfy the EASA Part-147 requirements in the future.

EASA Part-147 training and Part-66 licenses are fundamental to the world of aircraft maintenance. EASA Part-145 approved maintenance organisations cannot operate without Part-66 licensed engineers and part-147 MTOs are needed to train engineers. This system of common technical requirements and administrative procedures for ensuring the continuing airworthiness of aircraft is respected throughout the world and being adopted by many national aviation authorities.

Over the 13 years that KU delivered the FD Aircraft Engineering, and the associated BSc(Hons) Top-Up, many hundreds of successful FD students went on to obtain careers in the aircraft maintenance industry. And, several hundred practising licensed engineers completed the top-up course and were awarded an honours degree to complement their vocational licence. Therefore, it is probably true to say that you will find an ex-Kingston Aircraft Engineering student in almost every maintenance organisation in the UK and in a good number of overseas organisations as well.

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

As above

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

n/a

I. Development of Course Learning Outcomes in Modules

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

Module Code		Level 4						Level 5					
		AE4002	AE4012	AE4014	AE4001	AE4011	AE4015	AE5043	AE5032	AE5024	EG5016	AE5033	AE5001
Knowledge & Understanding	A1	S			S								
	A2	S			S								S
	A3												
	A4												
Intellectual Skills	B1												

	B2	S											S
	B3	S											S
	B4												
Practical Skills	C1												
	C2												
	C3	S											S
	C4												

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