

Template C4



Programme Specification

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

Date first produced	12/12/2013
Date last revised	04/09/2024
Date of implementation of current version	01/09/2024
Version number	5
Faculty	Faculty of Engineering, Computing and the Environment
School	School of Engineering
Department	Department of Aerospace and Aircraft Engineering
Delivery Institution	Cardiff and Vale 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): <i>Up to 10 pathways</i>	BA (Hons) BEng(Hons) Aircraft Engineering
Intermediate Awards(s) and Title(s): <i>There are 4 Intermediate awards for each pathway</i>	CertHE PgCert
Course Code <i>For each pathway and mode of delivery</i>	UFAIE1AIE20
UCAS code <i>For each pathway</i>	4Q58Site codes:V - Cardiff and Vale College (ICAT)

RQF Level for the Final Award:	6
Awarding Institution:	Kingston University
Teaching Institution:	Cardiff and Vale College
Location:	CAVC
Language of Delivery:	English (at all delivery sites)
Modes of Delivery:	Full-time
Available as:	Full field
Minimum period of registration:	Full-time - 3
Maximum period of registration:	Full-time - 6
Entry Requirements:	<p>The minimum standard entry qualifications for the programme are:</p> <ul style="list-style-type: none"> • 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 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. <p>Plus:</p>

	<p>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.</p> <p>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.</p> <p>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.</p>
Programme Accredited by:	RAeS
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:	.
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 engineering graduates who are equipped with the technical knowledge, understanding and skills; and the personal and professional qualities to obtain employment and succeed in the aircraft maintenance industry.
- Provide students with the academic and professional knowledge and skills that will enable them to manage their own personal and professional development when they leave the university; and to encourage them to be proactive in the furtherance of their careers and development of themselves.
- Produce the aircraft maintenance engineering managers of the future; managers who will look on Kingston University as having played a major part in their success.

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 is accredited by the Royal Aeronautical Society as fully satisfying the educational requirements for registration as an Incorporated Engineer

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		Intellectual Skills		Subject Practical Skills
	On completion of the course students will be able to:		On completion of the course students will be able to		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	Recognise, evaluate and analyse problems; identify and investigate possible solutions and make sound decisions regarding the solution to adopt and/or the course of action to be taken.	C1	Perform aircraft maintenance activities correctly and safely, identify defects in aircraft structures, systems, equipment, components and hardware; and determine the best solution and/or course of action to be taken.
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, collect, collate, interpret and critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), and use it to make judgements, and to frame appropriate questions to help achieve a solution.	C2	Investigate and analyse the operation of aircraft equipment and systems to determine and/or confirm serviceability and for defect diagnosis.
A3	Demonstrate a clear understanding of the legal obligations pertaining to licensed aircraft maintenance engineers, the rules and regulations under which they must work and the need to always consider flight safety.	B3	Communicate clearly and succinctly orally, graphically and in writing having due regard for the receiving audience and intellectual property rights.	C3	Make effective use of aircraft maintenance manuals and other industry related publications and complete documentation associated with the maintenance of aircraft and airworthiness.
A4	Discuss the topics of ethics and sustainability in relation to aircraft maintenance engineering and the decisions made by licensed engineers.	B4	Manage their own personal and professional development by identifying gaps and/or shortfalls in their knowledge, understanding and skills and taking the necessary action to rectify it.	C4	Use a range of office, engineering and aircraft industry related IT equipment and software confidently and effectively.
A5	Apply business methods to assess the economic and financial aspects			C5	Work independently or as part of a team to initiate, investigate, plan, manage and drive projects to a

	of air transport and/or engineering projects.				successful conclusion and produce the associated documentation (proposals, plans, reports, presentations).
--	---	--	--	--	--

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

Students complete all three years of the programme at an EASA/CAA part-147 approved training organisation.

The course is offered in full-time mode 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.

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.

Full details of each module will be provided in module descriptors and student module guides.

Note: As per GR5 within the general regulations, the University aims to ensure that all option modules listed below are delivered. However, for various reasons, such as demand, the availability of option modules may vary from year to year or between teaching blocks. The University will notify students by email as soon as these circumstances arise.

BA (Hons) BEng(Hons) Aircraft Engineering

Level 4							
BA (Hons) BEng(Hons) Aircraft Engineering							
Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Aerodynamics and Theory of Flight	AE401 1	15	4	1	None	1	1
Aircraft Electronic and Digital Systems	AE401 2	15	4	2	None	1	1
Electrical Engineering Fundamentals	AE400 2	30	4	1&2			

Mathematics and Physics for Practitioner Engineers	AE400 1	30	4	1&2			
Navigate for Aircraft Engineering	AE401 5	15	4	1	None	1	1
Sustainability in Aircraft Engineering	AE401 3	15	4	2	None	1	1
Optional Modules							

Level 5							
BA (Hons) BEng(Hons) Aircraft Engineering							
Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Aircraft Electrical & Avionics systems	AE502 4	15	5	2	None	2	
Aircraft Materials, Hardware and Maintenance	AE500 1	30	5	1&2			
Aircraft Structures and their Mechanical Systems	AE503 2	15	5	1	None	2	2
HE Study Skills and Explore	AE503 0	15	5	1	None	2	
Practical Engineering Skills and CAD	AE500 3	30	5	1&2			
Professional Practice for Aircraft Engineers	AE500 5	15	5	2	None	2	
Optional Modules							

Level 6							
BA (Hons) BEng(Hons) Aircraft Engineering							
Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Air Transport Economics	AUG25 -07003	15	6	TB2		3	
Aircraft Maintenance Practices	AE600 2	30	6	1&2			
Aircraft Propellers	AUG25 -07001	15	6	2	None	3	
Applied Business Management	EG602 6	15	6	TB1		3	
Individual Project – I (Ref: IEng)	EG601 7	30	6	1&2			
Turbine Engines	AUG25 -07002	15	6	1	None	3	
Optional Modules							

D. Principles of Teaching, Learning and Assessment

In the first year of the programme, two modules provide the fundamental mathematics, physics and electrical and electronic engineering knowledge needed to understand the operation of the aircraft systems that are studied later in the course. The HE Study Skills and Personal Development module introduces students to the academic skills and personal qualities needed to successfully complete the course and gain the most out of it. And, the Aerodynamics and Aircraft Electronic and Digital Systems module provides an element of route-specific material by looking at how vehicles that are heavier than air are able to fly and the digital systems used for navigating, displaying flight information and distributing data around the aircraft.

The second year will build on the fundamental knowledge and skills gained in the first year. For the students on route one, the focus this year will be on aircraft with the students studying airframe construction, aircraft materials, hardware and systems, and aircraft maintenance. However, students are also introduced to independent learning, professional practice and the topics of ethics and sustainability, and project planning and network analysis. A large variety of assessment methods will be used to assess the technical modules, including: assignments, practical exercises, in-class tests, a group presentation and a Log Book and a portfolio of evidence for the Professional Practice for Aircraft Engineers module. By the end of the second year, the students will have a knowledge and understanding of aircraft construction and all of the mechanical and electrical systems found on a typical large jet aircraft. They will also have gained experience of aircraft hand-skills, fundamental aircraft maintenance activities, project planning and independent learning. For the students on route two, 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: AE5xxx 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 study skills module in year one and the professional practice module in year two both require students to produce a portfolio of evidence that includes a reflective study journal and pieces of work based on and/or completed for the other modules in the year. A “contents specification” will be supplied for each portfolio and the summative assessment 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; teaching teams, in particular the module leader(s), will periodically review the contents of the portfolios and provide written and oral feedback to the students both individually and in groups. The portfolio will also 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.

The third year of the programme for both routes continues with the aircraft theme but is also intended to broaden the students’ horizons and provide them with opportunities to demonstrate what they have gained from the programme; it gives the students an opportunity to put everything they have learned into practice and to come out of their comfort zone and “stretch” themselves. The Individual Project module combines the technical and academic facets of the programme and provides students with an opportunity to complete a capstone project and demonstrate the academic and/or professional skills they have acquired whilst on the programme as well as the technical knowledge and skills.

A large variety of different assessment methods are used in the programme and all modules in the programme have formal and informal assessment, and formative and summative assessment associated with them. The forms of assessment used in any one module

depends on the nature of the material being delivered and the way it is delivered but includes informal in-class tests, micro-teaches, work-books, practical exercises, tutorial questions, end-of-module examinations and even an answer-checking spreadsheet that enable students to write their own fundamental electrical engineering questions and check their answers.

All of the coursework that students complete is formative as well as summative. The feedback from coursework and the informal assessment given in lectures and tutorials and as directed self-study all enable the students' to gauge their level of knowledge and understanding and help them prepare for end-of module examinations and, in many cases, later pieces of assessment. The coursework and informal assessment also enables staff to determine the rate and level of progress of the students and their strengths and weaknesses and to manage the learning accordingly.

The programme is designed to develop the students' academic and technical knowledge and understanding, their academic and professional skills, and their personal qualities, and ultimately prepare them for employment. The assessment strategy has been designed in the same way: to develop the students rather than simply assess them to make sure they satisfy learning outcomes.

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 Director 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.
- Project Supervisors to provide academic support and guidance on project related matters.
- 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.
- StudySpace – 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.
- School Education Committee(SEC).
- Annual review and development.
- Periodic reviews undertaken at subject level.
- Student Voice Committee (SVC) meetings.
- Moderation and feedback policies.

SVC meetings and local Education Committee meetings 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 Education Committee feed into the School Education Committee which in turn feeds into the Faculty Board.

In addition to the SVCs and ECs, 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.

Incorporated Engineer accreditation for the programme will be sought from the Royal Aeronautical Society. 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; more specifically, it is designed to produce the aircraft maintenance managers of the future. 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) and honours top-up 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).

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

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 and 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.

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

www.kingston.ac.uk

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	Level 6
-------------	---------	---------	---------

		AE4002	AE4001	AE4012	AE4011	AE4015	AE4013	AE5032	AE5024	AE5030	AE5005	AE5001	AE5003	AE6002	EG6017	EG6026	AUG25-07003	AUG25-07002	AUG25-07001
Knowledge & Understanding	A1	S			S	S	S											S	S
	A2	S			S	S	S		S	S		S	S					S	S
	A3																		
	A4							S			S			S					
	A5										S								
Intellectual Skills	B1				S										S				
	B2														S				
	B3				S	S	S	S				S						S	S
	B4							S						S	S				
Practical Skills	C1									S									
	C2																		
	C3																		
	C4														S				
	C5						S		S				S		S				

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