

<b>Module Title:</b>	Aircraft Technology	<b>Level:</b>	4	<b>Credit Value:</b>	20
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<b>Module code:</b>	ENG491	<b>Is this a new module?</b> Yes	<b>Code of module being replaced:</b>	ENG479
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<b>Cost Centre(s):</b>	GAME	<b>JACS3 code:</b>	H410
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<b>Trimester(s) in which to be offered:</b>	1, 2	<b>With effect from:</b>	September 18
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<b>School:</b>	Faculty of Arts, Science and Technology	<b>Module Leader:</b>	Dr Zheng Chen
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Scheduled learning and teaching hours	60 hrs
Guided independent study	140 hrs
Placement	0 hrs
<b>Module duration (total hours)</b>	200 hrs

<b>Programme(s) in which to be offered</b>	Core	Option
BEng (Hons) Aeronautical & Mechanical Engineering	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<b>Pre-requisites</b>
None

Office use only

Initial approval: February 17

APSC approval of modification: Sept 18

Have any derogations received Academic Board approval?

If new module, remove previous module spec from directory?

Version: 1

Yes  No  N/A

Yes  No

**Module Aims**

To develop an understanding of current published and forward-looking experimental developments within the world-wide aircraft industry and to anticipate the adoption of particular technologies in the future.

**Intended Learning Outcomes**

- Key skills for employability
- KS1 Written, oral and media communication skills
- KS2 Leadership, team working and networking skills
- KS3 Opportunity, creativity and problem solving skills
- KS4 Information technology skills and digital literacy
- KS5 Information management skills
- KS6 Research skills
- KS7 Intercultural and sustainability skills
- KS8 Career management skills
- KS9 Learning to learn (managing personal and professional development, self-management)
- KS10 Numeracy

At the end of this module, students will be able to

Key Skills

1	Demonstrate knowledge of main stream technologies for current aircraft and the understanding of the requirements on technology advances;	KS1	
		KS5	
2	Demonstrate knowledge of a range innovative, experimental and prototype aircraft for future aircraft technology; <b>contextualise uncertainty in aircraft development using social, ethical, economic and sustainability constraints.</b>	KS1	
		KS5	
3	Demonstrate knowledge of the present and future legislation and green effects for airframe, propulsion and control innovations for novel aircraft and compare with more established conventions.	KS1	KS7
		KS5	
		KS6	

Transferable skills and other attributes

1. Information search
2. Evaluation of information

**Derogations**

A derogation from regulations has been approved for this programme which means that whilst the pass mark is 40% overall, each element of assessment (where there is more than one assessment) requires a minimum mark of 30%.

**Assessment:**

The learning outcome will be assessed by means of a portfolio covering investigation/evaluation activities. Students must be individually assessed. Individual presentations with an associated report may be used to explain findings and to demonstrate understanding but group presentations can also be used provided that the individual's contribution is clearly defined.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)	Duration (if exam)	Word count (or equivalent if appropriate)
1	1, 2, 3	Portfolio	100%		4000

**Learning and Teaching Strategies:**

This module should be largely investigative in nature but with some direction though guidance notes within the written assignment exercise. Work should be guided by keynote lectures (limited in number) and supported by occasional small group tutorials. The material should be guided in the light of current/recent developments but with an onus put on each student to develop a deeper knowledge via individual or small group work. Students would be expected to use internet resources and library, statistical projections, computer modelling/simulation packages, practical testing or other methods to verify the effects of developments.

**Syllabus outline:**

**Current aircraft technologies:** survey of the range of current technologies relating to aircraft design, manufacturing, materials, etc. and an in-depth knowledge of one.

**Technology advances:** materials used, aerofoil and fuselage shapes and configurations (canard/delta/conventional); drag reduction measures; engines, other propulsion; fuel efficiency measures.

**Aircraft Developments:** investigate a cross-section of current developments; for example, unmanned combat and transport aircraft.

**Environmental legislation:** Investigation of current legislation and "green" methods in aircraft evaluation, viability of the developments investigated, extrapolate trends to predict future aircraft design features from environmental perspective.

**Bibliography:**

**Essential reading**

Kroes, M. Rardon, J. and Nolan, M.; (2013) Aircraft Basic Science; 8<sup>th</sup> edition; McGraw-Hill Education

**Other indicative reading**

Breuer, U.P.; (2016) Commercial Aircraft Composite Technology; Springer.  
Aeronautical Journal: Royal Aeronautical Society ([www.aerosociety.com](http://www.aerosociety.com)), London.  
Aeronautics and air transport: beyond vision 2020; towards 2050 (2010) Belgium: ACARE.  
Aerospace and defence technology report (2003) DTI publication on Aerospace in 2020.  
London: DTI, HMSO.  
Aerospace: Aeronautical journal of the Institution of Mechanical Engineers ([www.imeche.org](http://www.imeche.org)), London.  
Flight International: Reed Business international, London.  
Publications by the American Institute of Aeronautics and Astronautics ([www.aiaa.org](http://www.aiaa.org)).