

Module specification

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Module Code	ENG4B5
Module Title	Modern Aircraft Technology
Level	4
Credit value	20
Faculty	FAST
HECoS Code	100229
Cost Code	GAME

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
BEng Aeronautical Engineering	Core
BEng Aeronautical Engineering with Industrial Placement	Core
MEng Aeronautical Engineering	Core

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	36 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	36 hrs
Placement / work based learning	0 hrs
Guided independent study	164 hrs
Module duration (total hours)	200 hrs

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Initial approval date	22/08/2022
With effect from date	September 2022

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Date and details of revision	
Version number	1

Module aims

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

Module Learning Outcomes - at the end of this module, students will be able to:

1	Describe mainstream technologies and components of current aircraft.
2	Explain the needs of future aircraft technology with reference to ethical and sustainable requirements.
3	Identify the present aviation and airworthiness legislation, and the consideration of future changes due to sustainable and environmental needs.

In addition to the module learning outcomes, students will also cover the following accreditation of higher education programme (AHEP) fourth edition learning outcomes: C1.

Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

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. Portfolio should have a minimum word count of 4000.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1,2,3	Portfolio	100%

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%.

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 including the Flight Simulator, practical testing or other methods to verify the effects of developments. This module maybe undertaken synchronously, or asynchronously, and could be delivered face to face, or via online methods.

The module is taught through a combination of lectures and workshops. An active and inclusive approach is used to engage learners in the topics and will involve individual, group work and flipped learning experiences aligned to the university's Active Learning Framework (ALF). The approach offers students a flexible and adaptive learning experience that can accommodate a range of options that includes both on campus learning and remote learning where appropriate.

The Moodle VLE and other on-line materials and resources will be available to support learning. ALF offers a balance between the classroom elements and digitally enabled activity incorporating flexible and accessible resources and flexible and accessible feedback to support learning.

Indicative Syllabus Outline

Current aircraft technologies:

Survey of the range of current technologies relating to aircraft design, manufacturing, materials, etc. specialising with in-depth knowledge of one of them.

Technology advances:

Materials used, sustainability of materials, 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.

Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads

M. Kroes, et al., *Aircraft Basic Science*, 8th ed. McGraw-Hill Education, 2013

Other indicative reading

U.P. Breuer, *Commercial Aircraft Composite Technology*. Springer, 2016.

Aeronautical Journal. Royal Aeronautical Society (www.aerosociety.com), London.

Aeronautics and air transport: beyond vision 2020; towards 2050, Belgium: ACARE, 2010.

Aerospace. Aeronautical journal of the Institution of Mechanical Engineers (www.imeche.org), London.

Flight International. Reed Business international, London.

Publications by the American Institute of Aeronautics and Astronautics (www.aiaa.org).

Employability skills – the Glyndŵr Graduate

Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas.

Core Attributes

Engaged
Enterprising

Key Attitudes

Commitment
Curiosity
Confidence
Adaptability

Practical Skillsets

Leadership and Team working
Critical Thinking
Communication