

University of the West of Scotland

Module Descriptor

Session: 2024/25

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| Title of Module: Model Aircraft Design Group Project | | | |
| Code: ENGG10038 | SCQF Level: 10 (Scottish Credit and Qualifications Framework) | Credit Points: 20 | ECTS: 10 (European Credit Transfer Scheme) |
| School: | School of Computing Engineering and Physical Sciences | | |
| Module Co-ordinator: | Dr Tony Leslie | | |
| Summary of Module | | | |
| <p>The design of a model aircraft captures many of the initial considerations of actual aircraft design and this approach will provide students with the opportunity to assemble a variety of the learning from several of the modules previously undertaken in a manageable group activity.</p> <p>Working in small groups the students will analyse a provided design brief, determine a project plan and resource usage, utilising an appropriate design process model throughout the activity will result in the preparation of conceptual and final designs and detailed calculations relating to sizing, lift and drag, power and endurance/range. An appropriate design verification strategy will be employed as part of the chosen design process model resulting in detailed drawings and 3D models of the final design.</p> <p>Outcome 1 is intended to allow students to demonstrate their ability to analyse a complex model aircraft design brief and determine a suitable approach to the design solution.</p> <p>Outcome 2 is intended to further develop student's project management skills with multiple resources and numerous complex tasks some asynchronous some concurrent.</p> <p>Outcome 3 is intended, whilst following a design process model, to demonstrate the students' ability to develop detailed conceptual and final designs to fulfil the design brief.</p> <p>Outcome 4 is intended to allow students to demonstrate their ability to analyse, using a verification strategy the suitability of the final design and project.</p> <p>During the course of this module students will develop their UWS Graduate Attributes (https://www.uws.ac.uk/current-students/your-graduate-attributes/) in the following areas-</p> <p>Universal: Academic - Critical thinking, analytical & inquiring mind; Personal- Emotionally Intelligent Ethical; Professional- Collaborative, Research Minded</p> <p>Work-Ready: Academic - Knowledgeable, Digitally Literate, Problem Solver; Personal - Effective Communicator; Professional - Ambitious, Potential Leader</p> <p>Successful : Academic - Autonomous, Innovative; Personal - Creative, Imaginative, Resilient; Professional- Driven</p> | | | |

This module has been reviewed and updated, taking cognisance of the University's Curriculum Framework principles. Examples of this are found within the module such as active and engaging, module assessment which reflects industry design activities, development of digital intelligence meta-skills, learning synergies across modules and levels of study, self-direction of curriculum, small group supervision providing concurrent weekly feedback on progress and the use of real-world practical student generated data. In the context of Curriculum Framework this module may be viewed as a capstone module.

| Module Delivery Method | | | | | |
|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Face-To-Face | Blended | Fully Online | HybridC | Hybrid 0 | Work-Based Learning |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| See Guidance Note for details. | | | | | |

| Campus(es) for Module Delivery | | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------|--------|
| The module will normally be offered on the following campuses / or by Distance/Online Learning: (Provided viable student numbers permit) (tick as appropriate) | | | | | | |
| Paisley: | Ayr: | Dumfries: | Lanarkshire: | London: | Distance/Online Learning: | Other: |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

| Term(s) for Module Delivery | | | | | |
|---|-------------------------------------|--------|-------------------------------------|--------|--------------------------|
| (Provided viable student numbers permit). | | | | | |
| Term 1 | Term 2 | Term 3 | Term 4 | Term 5 | Term 6 |
| | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input type="checkbox"/> |

| Learning Outcomes: (maximum of 5 statements) | |
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| At the end of this module the student will be able to: | |
| L1 | L1. Analyse a model aircraft design brief and select an appropriate design process model. |
| L2 | Construct an appropriately detailed project plan. |
| L3 | Develop appropriately detailed conceptual and final designs. |
| L4 | Analyse using a verification strategy the suitability of the final design and project. |
| Employability Skills and Personal Development Planning (PDP) Skills | |

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| SCQF Headings | During completion of this module, there will be an opportunity to achieve core skills in: |
| Knowledge and Understanding (K and U) | <p>SCQF Level 10</p> <p>A broad knowledge and understanding of aircraft wing design, aircraft weight and balance, stability and control, structures and conceptual design.</p> <p>Specific and detailed knowledge and understanding of the application, techniques and practices associated with aircraft wing design, aircraft weight and balance, structures and conceptual design.</p> |
| Practice: Applied Knowledge and Understanding | <p>SCQF Level 10</p> <p>Applying knowledge and understanding to analyse and produce a suitable design solution to a project brief.</p> <p>Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed.</p> <p>Select and critically evaluate technical literature and other sources of information to solve complex problems.</p> <p>Design solutions for complex problems that evidence some originality and meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.</p> <p>Apply an integrated or systems approach to the solution of complex problems.</p> <p>Evaluate the environmental and societal impact of solutions to complex problems (to include the entire life-cycle of a product or process) and minimise adverse impacts. Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.</p> <p>Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.</p> |
| Generic Cognitive skills | <p>SCQF Level 10</p> <p>Evaluating and analysing aerodynamic, performance and structural data and the impact that the results have on the design and operation of the aircraft.</p> |

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| | Assembling information together from a variety of sources during problem solving and being able to explain potential problems with methods and strategies. | |
| Communication, ICT and Numeracy Skills | <p>SCQF Level 10</p> <p>Ability to perform, interpret and evaluate complex numerical, geometrical and graphical data and using it to solve problems associated with aerodynamic concepts.</p> <p>Using communications skills to prepare and deliver technical reports, including text and illustration and deliver oral poster presentation.</p> | |
| Autonomy, Accountability and Working with others | <p>SCQF Level 10</p> <p>Identifying and addressing their own learning needs both during and out with class time. Identifying solution routes and strategies using their own initiative and informed judgements.</p> <p>Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.</p> <p>Function effectively as an individual, and as a member or leader of a team. Evaluate effectiveness of own and team performance.</p> <p>Communicate effectively on complex engineering matters with technical and non- technical audiences, evaluating the effectiveness of the methods used.</p> | |
| Pre-requisites: | Before undertaking this module the student should have undertaken the following: | |
| | Module Code: ENGG09027 | Module Title: Aircraft Design and Performance |
| | Other: | |
| Co-requisites | Module Code: | Module Title: |

*Indicates that module descriptor is not published.

Learning and Teaching

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| The learning and teaching for this module will be delivered via a series of tutorials in the form of group discussions. | |
| Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below: | Student Learning Hours (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities) |
| Tutorial/Synchronous Support Activity | 36 |
| Independent Study | 164 |
| | Hours Total 200 |
| **Indicative Resources: (eg. Core text, journals, internet access) | |
| The following materials form essential underpinning for the module content and ultimately for the learning outcomes: Simmons, M. (2015) Model Aircraft Aerodynamics, Dorset, Special Interest Model Books Pressnell, M. (2015) Model Planes: Aerofoils and Wings, Ramsbury Robert Hale Ltd Raymer, D, P. (2012) Aircraft Design a Conceptual Approach, American Institute of Aeronautics & Astronautics | |
| (**N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material) | |
| Attendance and Engagement Requirements | |
| In line with the Student Attendance and Engagement Procedure : Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time. | |

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| Equality and Diversity |
| The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: UWS Equality, Diversity and Human Rights Code . |
| (N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School) |

Supplemental Information

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| Divisional Programme Board | Engineering and Physical Sciences |
| Assessment Results (Pass/Fail) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| School Assessment Board | Engineering |
| Moderator | Bassam Rakhshani |
| External Examiner | E Tingas |
| Accreditation Details | This module is part of the IMechE accredited programmes BEng/Meng (Hons) Aircraft Engineering. |
| Changes/Version Number | 2.14 (was 2.13) Module Delivery Changed to Face-To-Face from Hybrid C. |

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| Assessment: (also refer to Assessment Outcomes Grids below) |
| <p>Formative assessment will be undertaken weekly as individual's engagement and contribution to the group discussion is continually monitored. This will enable timely feedback to be provided to the students and if required concurrent adjustment of the learning and teaching to be implemented.</p> <p>Summative assessment will be in two forms, written group submission (70%) and Poster/PowerPoint presentation (30%).</p> <p>Assessment Category 1: Group Written Coursework Submission – 70%</p> <p>Assessment Category 2: Group Presentation- Weight - 30%</p> <p>A minimum overall 40% is required to achieve a pass in this module with 30% minimum in each component.</p> <p>(N.B. (i) Assessment Outcomes Grids for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed. (ii) An indicative schedule listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Module Handbook.)</p> |

Assessment Outcome Grids (See Guidance Note)

| Component 1 | | | | | | |
|--------------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|--|---------------------------------|
| Assessment Type (Footnote B.) | Learning Outcome (1) | Learning Outcome (2) | Learning Outcome (3) | Learning Outcome (4) | Weighting (%) of Assessment Element | Timetabled Contact Hours |
| Dissertation/ Project report/ Thesis | ✓ | ✓ | ✓ | ✓ | 70 | 0 |

| Component 2 | | | | | | |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|--|---------------------------------|
| Assessment Type (Footnote B.) | Learning Outcome (1) | Learning Outcome (2) | Learning Outcome (3) | Learning Outcome (4) | Weighting (%) of Assessment Element | Timetabled Contact Hours |
| Presentation | ✓ | ✓ | ✓ | ✓ | 30 | 2 |
| Combined Total for All Components | | | | | 100% | 2 hours |