Module Descriptor

Title	Theory & Operation of Uncrewed Aerial Systems		
Session	2024/25	**Status**	Published
Code	COMP11135	**SCQF Level**	11
Credit Points	10	**ECTS (European Credit Transfer Scheme)**	5
School	**Computing, Engineering and Physical Sciences**		
Module Co-ordinator	J Riordan		

Summary of Module

This module provides students with the theoretical foundation and practical knowledge necessary for the safe and effective operation of uncrewed aerial systems (UAS). It covers key topics such as air law, safety protocols, airspace management, and flight planning. The assessment consists of a consolidated flight plan and risk management report, enabling students to demonstrate their ability to design, plan, and assess drone operations within regulatory frameworks.

The module also prepares students to sit the General Visual Line of Sight Certificate (GVC) theory and practical exams, which are externally assessed. Attaining the GVC is mandatory for handling and operating drones in other MSc modules. The GVC is the remote drone pilot certification in the UK that is provided by the Civil Aviation Authority (CAA).

The module is designed to ensure fairness and inclusivity, following the UWS Assessment Handbook principles, allowing all students to meet learning outcomes without mandatory physical flight assessments. It ensures students are ready to apply advanced knowledge of drone technology while meeting the operational and regulatory standards required in the industry.

The module syllabus covers topics such as:

- Air law and responsibilities
- Airspace operating principles
- Airmanship and aviation safety
- Human performance limitations
- Meteorology
- Navigation and charts
- UAS general knowledge and flight performance

This module will work to develop a number of the key 'I am UWS' Graduate Attributes to make those who complete this module:

- Universal: analytical; emotionally intelligent; collaborative

• Work Ready: problem-solver; digitally literate; effective communicator • Successful: autonomous; incisive; resilient

Module Delivery Method	**On-Campus**[1] ☒	**Hybrid**[2] ☒	**Online**[3] ☐	**Work -Based Learning**[4] ☐
Campuses for Module Delivery	☐ Ayr ☐ Dumfries	☒ Lanarkshire ☐ London ☐ Paisley	☒ Online / Distance Learning ☐ Other (specify)	

Terms for Module Delivery	Term 1	☒	Term 2	☒	Term 3	☐
Long-thin Delivery over more than one Term	Term 1 – Term 2	☐	Term 2 – Term 3	☐	Term 3 – Term 1	☐

Learning Outcomes	
L1	Understand regulatory frameworks governing drone operations.
L2	Demonstrate proficiency in planning, executing, and managing drone flights and ensuring compliance with safety and legal standards.
L3	Conduct risk assessments of drone operations and implement effective mitigation strategies.
L4	Effectively communicate detailed operational plans considering factors such as airspace management, navigation, weather conditions, and operational constraints.
L5	Exercise autonomy in managing drone operations and demonstrate accountability in meeting legal and safety standards.

Employability Skills and Personal Development Planning (PDP) Skills	
SCQF Headings	**During completion of this module, there will be an opportunity to achieve core skills in:**
Knowledge and Understanding (K and U)	**SCQF 11** Demonstrate a comprehensive understanding of the legal and regulatory frameworks governing drone operations, with a specific focus on the

[1] Where contact hours are synchronous/ live and take place fully on campus. Campus-based learning is focused on providing an interactive learning experience supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus contact hours will be clearly articulated to students.

[2] The module includes a combination of synchronous/ live on-campus and online learning events. These will be supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus and online contact hours will be clearly articulated to students.

[3] Where all learning is solely delivered by web-based or internet-based technologies and the participants can engage in all learning activities through these means. All required contact hours will be clearly articulated to students.

[4] Learning activities where the main location for the learning experience is in the workplace. All required contact hours, whether online or on campus, will be clearly articulated to students

	requirements and guidelines of the General Visual Line of Sight Certificate (GVC) as stipulated by the Civil Aviation Authority (CAA). Critically analyse the principles of risk assessment and management specific to uncrewed aerial systems (UAS) operations, emphasising safety protocols, airspace management, and regulatory compliance within the current regulatory framework.
Practice: Applied Knowledge and Understanding	**SCQF 11** Apply advanced knowledge of drone technologies and operational procedures to conduct safe and compliant flights under current regulations, including pre-flight planning, risk assessment, and in-flight decision-making. Develop and implement detailed operational procedures for drone missions, ensuring compliance with current regulations and standards, including emergency response planning and post-flight reporting.
Generic Cognitive skills	**SCQF 11** Critically evaluate and synthesize information from regulatory documents, safety guidelines, and best practices to inform and improve operational strategies in UAS missions within the current regulatory framework. Solve complex operational challenges in drone deployment by applying critical thinking and problem-solving skills, ensuring adherence to GVC regulations and safety standards.
Communication, ICT and Numeracy Skills	**SCQF 11** Effectively communicate detailed operational plans and compliance reports related to drone operations under current regulations, utilising precise terminology and clear presentation techniques suitable for technical and regulatory audiences. Utilise ICT tools to manage and document UAS operations, including the use of data logging software and digital mapping systems to support flight planning and post-flight analysis
Autonomy, Accountability and Working with Others	**SCQF 11** Exercise autonomy in planning, executing, and managing drone operations, demonstrating accountability in meeting legal and safety standards. Collaborate effectively with team members and regulatory bodies to ensure the safe and compliant operation of drones, integrating feedback and adhering to professional standards.

Prerequisites	**Module Code**	**Module Title**
	Other	
Co-requisites	**Module Code**	**Module Title**

Learning and Teaching
In line with current learning and teaching principles, a 20-credit module includes 200 learning hours, normally including a minimum of 36 contact hours and maximum of 48 contact hours.

Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	**Student Learning Hours** (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture / Core Content Delivery	12
Tutorial / Synchronous Support Activity	6
Asynchronous Class Activity	18
Independent Study	64
Please select	
Please select	
TOTAL	100

Indicative Resources
The following materials form essential underpinning for the module content and ultimately for the learning outcomes: All study materials will be provided on AULA with supplementary material made available through access to third party virtual learning environments. Relevant information provided by the Civil Aviation Authority is accessible at: https://www.caa.co.uk/drones/
(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. **For the purposes of this module, academic engagement equates to the following:** Attending all timetabled synchronous classes and engagement with asynchronous learning activities and resources.

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. Aligned with the overall commitment to equality and diversity stated in the Programme Specifications, the module supports equality of opportunity for students from all backgrounds and with different learning needs. Using our VLE, learning materials will be presented electronically in formats that allow flexible access and manipulation of content (part-time and distant learning students should check with their programme leader for any queries). The module complies with University regulations and guidance on inclusive learning

and teaching practice. Specialist assistive equipment, support provision and adjustments to assessment practice will be made in accordance with UWS policy and regulations.
(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

Divisional Programme Board	**Computing**
Overall Assessment Results	☐ **Pass / Fail** ☒ **Graded**
Module Eligible for Compensation	☐ **Yes** ☐ **No** **If this module is eligible for compensation, there may be cases where compensation is not permitted due to programme accreditation requirements. Please check the associated programme specification for details.**
School Assessment Board	Business and Applied Computing
Moderator	tbc
External Examiner	tbc
Accreditation Details	
Module Appears in CPD catalogue	☐ **Yes** ☐ **No**
Changes / Version Number	1.0

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
The module assessment consists of a Flight Plan and Risk Management Report. Students will create a comprehensive operational plan that includes pre-flight planning, airspace and risk analysis, safety procedures, and compliance with legal and regulatory requirements. This assessment demonstrates the ability to design and critically evaluate drone operations within industry standards, ensuring readiness for practical application in advanced modules and professional environments. Weighting: 100%
Assessment 2
Assessment 3
(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.)

Component 1							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**

Report of practical/field/clinical work	☒	☒	☒	☒	☒	100	2

Component 2							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
	☐	☐	☐	☐	☐		

Component 3							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
	☐	☐	☐	☐	☐		
Combined total for all components						100%	hours

Change Control

What	**When**	**Who**