Applied Learning

2026-28 Cohort; 2028 HKDSE

Item	Description
1. Course Title	UAV and Low-altitude Economy
2. Course Provider	UOW College Hong Kong
3. Area of Studies/ Course Cluster	Engineering and Production/ Services Engineering
4. Medium of Instruction	Chinese or English
5. Learning Outcomes	Upon completion of the course, students should be able to: (i) demonstrate an understanding of UAV technology and systems in low-altitude economic contexts; (ii) apply regulations and safety protocols through low-altitude UAV operations; (iii) apply various routine and technical skills to operate UAVs proficiently and tackle various problems related to operation and maintenance; (iv) execute pre-flight plans and flight maneuvers for low-altitude UAV tasks; (v) apply creative thinking to explore innovative UAV applications within the low-altitude economy, and propose suggestions for potential areas of improvement; (vi) demonstrate proper attitudes required in the industry; and (vii) enhance self-understanding and explore directions on further studies and career pursuits.

6. Curriculum Map – Organisation and Structure

First Year (90 hours)

Unit 1: Introduction to UAVs and Low-Altitude Economy (24 hours)

- History and Development of UAVs
- Classification of UAVs: Fixed-Wing, Rotary-Wing and Hybrid Designs
- Introduction to the Concept of Low-Altitude Economy
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- Future Trends in the Low-Altitude Economy

Unit 2: Case Studies of UAV Applications in the Low-Altitude Economy (24 hours)

- Surveying and Mapping: Photogrammetry and 3D Modelling
- Search and Rescue Operations
- Infrastructure Inspection and Monitoring
- Environmental Monitoring and Protection
- Applications in the Film and Photography Industry
- Emerging Applications in the Low-Altitude Economy: Delivery Services, Urban Air Mobility

Unit 3: UAV Systems and Operational Techniques (42 hours)

- Propulsion Systems: Electric Motors, Combustion Engines and Hybrid Systems
- Flight Control Systems and Stabilisation Techniques
- Navigation Systems: GPS, Inertial Navigation Systems and Obstacle Avoidance
- Communication Systems and Data Links
- Payload Technologies: Cameras, Sensors and Specialised Equipment
- Practical Exercises in basic UAV Operation: Indoor and Outdoor Practice

Second Year (90 hours)

Unit 4: Advanced UAV Operation Exercises (42 hours)

- Pre-Flight Planning and Checklists
- Basic Flight Movements: Takeoff, Landing, Hovering, and Navigation
- Understanding and Interpreting Telemetry Data
- Flight Modes and Autonomous Operations
- Basic UAV Coding Settings: Flight Control and Automation
- Application of Artificial Intelligence in UAV Operations

Unit 5: UAV Regulations and Safety in Low-Altitude Airspace (27 hours)

- UAV Regulations in Hong Kong and Internationally
- Risk Assessment and Management for UAV Flights
- Safety Protocols and Emergency Procedures
- Insurance and Liability Issues for UAV Operators
- Privacy and Ethical Considerations

Unit 6: Project Design and Management in the Low-Altitude Economy (21 hours)

- Defining Project Scope and Objectives in the Context of the Low-Altitude Economy
- Resource Allocation and Scheduling
- Risk Management in Low-Altitude UAV Projects
- Team Roles and Effective Communication
- Presentation Skills and Report Writing

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7. The Context

- The information on possible further study and career pathways is provided to enhance students' understanding of the wider context of the specific Applied Learning course.
- The recognition of Applied Learning courses for admission to further studies and career opportunities is at the discretion of relevant institutions. Students who have successfully completed Applied Learning courses have to meet other entry requirements as specified by the institutions.

Possible further study and career pathways

Further studies

- e.g. courses related to aviation, aerospace engineering, electrical engineering, mechanical engineering, computer science, robotics

Career development

- e.g. UAV pilot, UAV technician, aerial photographer/videographer, surveyor, precision agriculture specialist, search and rescue operator, infrastructure inspector

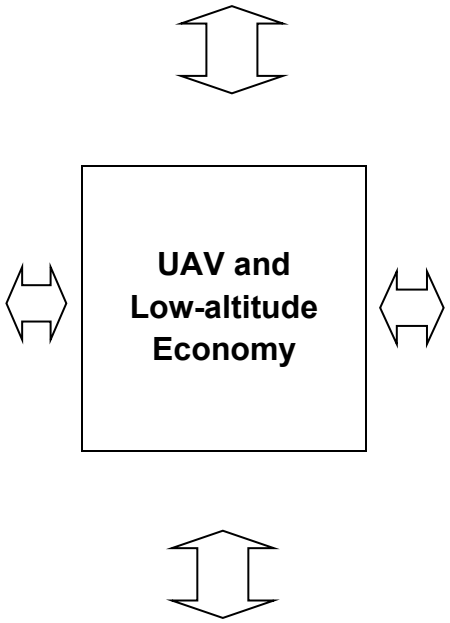
Complementarity with core subjects and other elective subjects

Enhancing and enriching**,** e.g.

- enhance students' learning of Physics by enriching knowledge on UAV flight dynamics and control systems.
- enhance students' understanding of Mathematics through data analysis, flight calculations and 3D modeling techniques used in UAV operations and simulations.

Expanding horizons**,** e.g.

- through UAV-based surveying and environmental monitoring, broadens students' knowledge in Geography using mapping, remote sensing and GIS applications.



Relations with other Areas of Studies/ courses of Applied Learning

e.g.

Engineering and Production

- concepts and knowledge related to UAV technology, flight dynamics, and control systems can enhance learning of aviation and engineering.

Business, Management and Law

- enhances students' understanding of modern logistics by demonstrating the use of UAV technology for efficient delivery services and infrastructure inspection.

Foundation knowledge developed in junior secondary education

The course is built upon the foundation knowledge students acquired in, e.g.

- **Mathematics Education** – data handling, geometry and algebra
- **Science Education** – forces, motion, electricity and magnetism

8. Learning and Teaching

In this course, student-centred learning and teaching activities are designed to enable students to understand fundamental theories and concepts, develop their generic skills, and address their career aspirations in low-altitude economy and UAV technology.

Different modes of activities are employed to provide students with a systematic understanding about the context (e.g. interactive seminars on UAV flight control systems, UAV flight training in simulated environments) and eye-opening opportunities to experience the complexity of the context (e.g. inviting industry experts to share practical application experiences, visiting logistics companies to see how UAVs are used).

Students acquire an understanding of the requirements, fundamental knowledge and skills essential for further learning within the area through learning-by-practising opportunities in an authentic or near-authentic environment (e.g. conducting indoors and outdoors UAV flight missions, analysing UAV applications in aerial photography).

Students are given opportunities to consolidate their learning and demonstrate entrepreneurship and innovation (e.g. designing flight plans for UAV delivery missions and exploring real UAV applications in the low-altitude economy).

9. Curriculum Pillars of Applied Learning

Through related contexts, students have different learning opportunities, for example:

(i) Career-related Competencies

- demonstrate broad operational and theoretical knowledge of UAV regulations and safety protocols;
- apply a range of technical skills to operate UAVs in various low-altitude economic contexts;
- apply various routine and well-practiced technical skills to tackle various problems related to UAV operation and maintenance;
- understand the future development trend of the UAV-related industries through visits and talks by industry practitioners; and
- enhance understanding of industry competency requirements through UAV operation training which are set according to the industry standard.

(ii) Foundation Skills

- apply information technology skills in research and information collection for projects; and
- enhance communication skills in both verbal and written forms through group discussion, presentation and project reports.

(iii) Thinking Skills

- apply problem-solving skills to assess risks and manage UAV flights safely in various UAV operation contexts;
- apply creative thinking to explore innovative UAV applications within the low-altitude economy, and propose suggestions for potential areas of improvement; and
- analyse and evaluate information independently to draw reasoned conclusions about UAV operations, and make predictions based on UAV project data and outcomes.

(iv) People Skills

- demonstrate collaborative skills through sharing knowledge and ideas, solving problems and settling conflicts in UAV projects;
- demonstrate self-management skills through planning, implementing and evaluating project outcomes; and
- demonstrate team spirit and interpersonal skills in group work and team collaboration.

(v) Values and Attitudes

- demonstrate a sense of responsibility and safety-first attitudes in UAV operations; and
- understand the social and environmental impacts of UAVs as well as the relevant legal and ethical requirements, and demonstrate proper attitudes.