

**Virginia Community College System
(VCCS) Unmanned Systems (UMS)
Courses Approved by VCCS**

UMS 111 Small Unmanned Aircraft Systems (sUAS) I

Course Description:

Introduces students to the history of small Unmanned Aircraft Systems (sUAS), surveys current platforms, applications, components, and sensors. Topics include the theory of flight, operations, manual flight, maintenance, and required record keeping. Introduces mission planning, crew management, and autonomous control. Emphasizes the ethical, legal, and safe use of sUAS.

Lecture 3 hours per week, 3 credits.

Course Prerequisites/Corequisites

General Course Purpose

This course is intended to provide beginning operational mission related concepts to those interested in becoming sUAS remote pilots. It provides introductory coverage of the operational requirements needed to complete simple missions and meet FAA regulations covering the operation of sUAS.

Course Objectives

Upon completion of this course, the student will be able to:

- Plan and implement simple sUAS missions to collect and analyze data.
- Perform the operations required to support simple missions e.g. plan, fly, collect data, maintain, repair, select sensors and analyze data.
- Understand the requirements of operating a sUAS in FAA controlled airspace.

Major Topics to be Included

Introduction to the small unmanned Aircraft System

- Historical evolution of the sUAS, civilian and defense contribution, and current state of the UAS development
- Use of sUAS

Small unmanned Aircraft System Elements

- Elements and functionality of an Small unmanned Aircraft System (sUAS)
- Aircraft vehicle design and payloads

Operation and Risk Assessment for sUAS

- Design strategies and risk assessment for sUAS missions Small UAS Mission Planning and Control
- Basic requirements for mission planning
- Factors that affect flight plans

Introductory small Unmanned Aircraft System Operations

- Pilot responsibilities.
- Modes of operating a sUAS
- Classes of airspace
- Small UAS personnel qualifications
- Small UAS products
- Types of sUAS products and sensors
- Small UAS data processing workflows

Civilian and Commercial Applications of the small Unmanned Aircraft Systems

- Applications of sUAS for civilian and commercial use

Strategy for Selecting a sUAS-based Geospatial Mapping System

- Considerations for selecting a sUAS for geospatial application
- Providers of sUAS, sensors, and data processing
- Techniques and software for creating mapping products such as orthographic photos and digital elevation models (DEM)

Small UAS Safety, Security and Privacy Issues

- sUAS and Cybersecurity