

# Unmanned Systems Education at Virginia Peninsula Community College

AUVSI Mid-Atlantic AAM  
Educator's Conference  
May 24, 2023

PRESENTED BY:

JULIE YOUNG, HEAD OF UMS PROGRAM

**VIRGINIA PENINSULA  
COMMUNITY COLLEGE**

# Current UMS Faculty at VPCCC



Julie Young - Mechanical Engineer  
UMS 107, UMS 111 and UMS 295



Marco Sterk – Aeronautical Engineer  
UMS 177



Randie Trestrail – Fine Arts  
UMS 295 and Marketing



Scott Bellows – Ecological Sciences  
UMS 107, UMS 111 and UMS 295



Pete Berquist - Geology  
UMS 111 and UMS 211



Cherie Aukland – GIS, IT  
UMS 211

# 5 UMS Courses in the VCCCS

## UMS 107

Regulations part of the FAA Part 107 Certification Exam.

## UMS 111

More on safety, flight planning, and manual flight.

## UMS 112

Flight data management.

## UMS 177

Maintenance and repair of motors, batteries, components.

## UMS 211

Autonomous flight planning, and flying.



Courses were developed by a panel from industry under the GeoTEd-UAS grant.

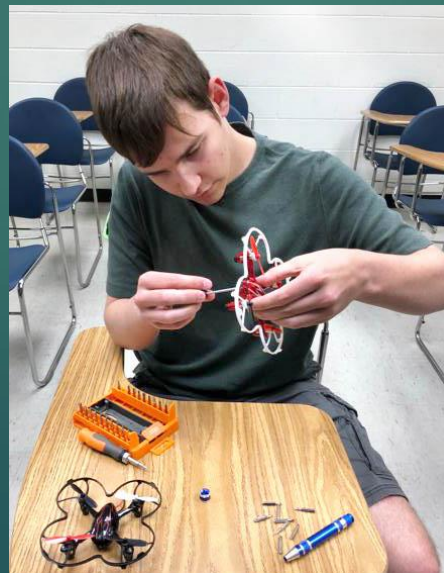
# VPCC Program began in 2017-2018

Originally 3 courses (9 credits)

- ▶ UMS 107
- ▶ UMS 111
- ▶ UMS 177

Embedded in the MEC AAS degree as approved electives.

First graduates May 2018.



# New UMS Courses Developed by VPCC

## UMS 295

Drones for Photography and Videos

- ▶ Cinematic movies and post-processing
- ▶ First offered in Spring 2022

## UMS 193

Photogrammetry, Mapping and Data Processing

- ▶ Autonomous drone missions for mapping and surveying
- ▶ Scheduled for Fall 2023



# CSC in sUAS at VPCC

## REQUIRED COURSES:

- UMS 107 Prepare to take the FAA Part 107 Exam.
- UMS 111 Learn to fly drones manually and safely.
- UMS 177 Build a drone. Learn how to repair and maintain.
- UMS 211 Learn to fly drones autonomously.

18 credits

Can be completed in 1 semester  
8 week and 12 week formats

## CHOOSE 2 ELECTIVES:

- UMS 193 Drones for Mapping and Surveying.
- UMS 295 Drones for Photography and Videos.
- GIS 200 Geographical Informational Systems I
- GIS 201 Geographical Informational Systems II

# CSC in sUAS at VPCC

Students will learn:

- ▶ Rules and regulations for legal flight in the National Airspace.  
(100% pass rate on the FAA Part 107 Remote Pilot Certification Exam.)
- ▶ To safely plan a flight mission.
- ▶ Flight skills for manual and autonomous flight.
- ▶ To build, maintain and repair sUAS.
- ▶ To collect imagery, mapping, flight data management and sensor selection.
- ▶ Photography and videography skills.
- ▶ Zephyr Drone Flight Simulator.

Courses offer hands-on experience. Drones are provided.

Field trips provide students opportunity to demonstrate flight skills.

Students can attend full time or part time. Students can use financial aid and GI Benefits.

<https://www.tncc.edu/programs/small-unmanned-aircraft-drone-systems-flight-technician-certificate>

# Flying on Campus and Beyond





# Enrollment Numbers

	UMS 107	UMS 111	UMS 177	UMS 211	UMS 295
Total Students	196	83	63	24	7

Year	Enrollment
2017 - 2018	11
2018 - 2019	25
2019 - 2020	54
2020 - 2021	32
2021 - 2022	131
2022 - 2023	149

# Next Steps at VPCC

# More UMS Electives to be Added

## UMS 290

Coordinated Internships

- ▶ Working with Virginia Space Grant Consortium and the CSIIP Program.
- ▶ Anticipated Fall 2023.

## UMS 295 – Unmanned Ground Systems


Developed with industry guidance and MOU

- ▶ Operation and maintenance of UGS.
- ▶ Robotics and software development.
- ▶ Scheduled for Fall 2023.

## UMS XXX

Payload and Sensors





# Notable UMS accomplishments at VPCC

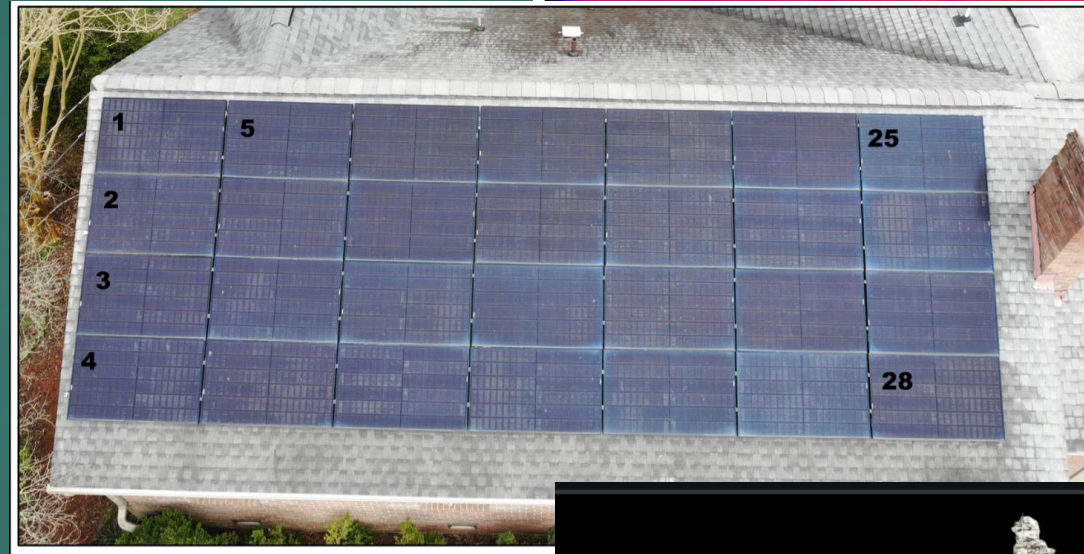
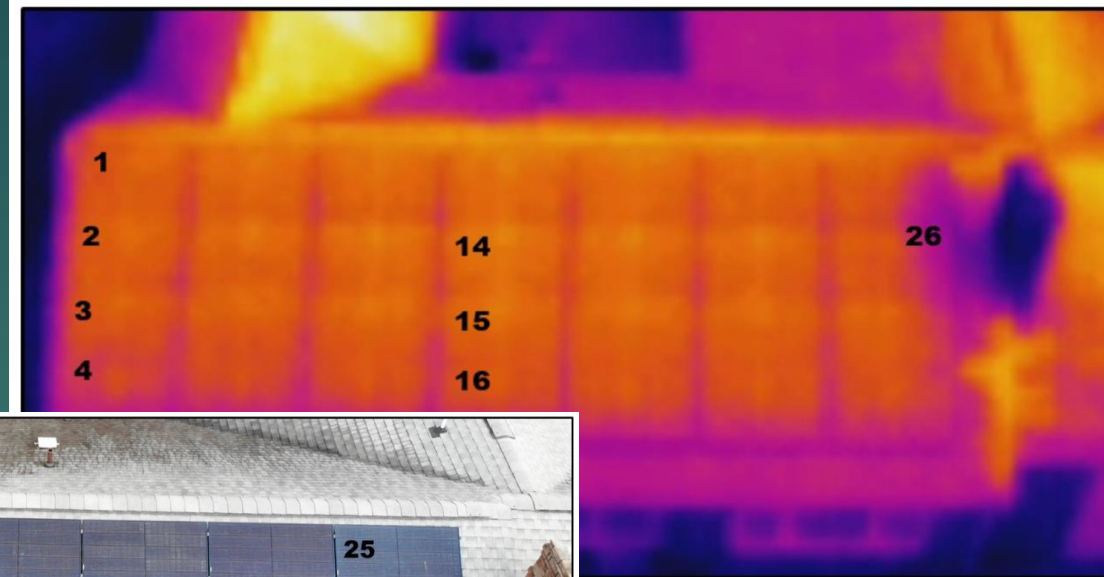
# External Partners Supporting Course Projects

- Dayspring Farm
- Sweethaven Lavender Farm
- Westover Family Farm
- Kingsmill Resort
- Carters Grove
- Colonial Williamsburg

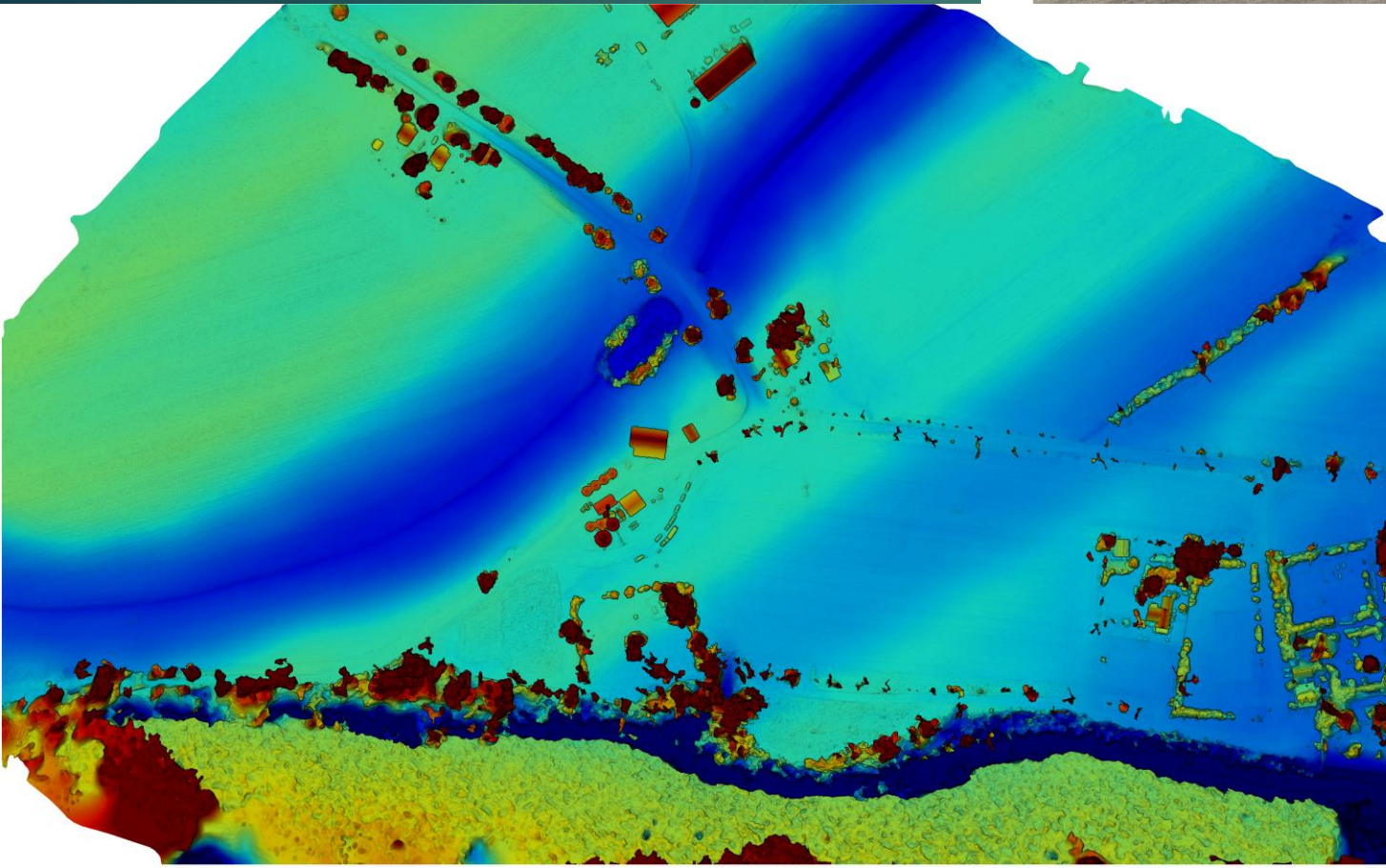
• LaRS Construction  
*Marquis & Stonehouse Projects*

• Breeden Construction  
*North Henry St Project*

• Virginia Department of  
Historic Resources



- Orthomosaics
- DEMs
- 3d models
- NDVI
- Solar Panel & Roof/structure Inspection
- Cut/Fill estimates



# Nauticus Exhibit (Summer 2022)



Julie and Scott helped to design an interactive drone course and trained museum staff.



# DARS Summer Camps

Partnership with Virginia's Department for Aging and Rehabilitative Services (DARS) for Students with Disabilities.





# VSGC/GeoTEd-UAS Internship



2 VPCC students and 2 Faculty conducted UAS research and flight testing at Virginia Tech led by Prof. Woolsey (Department of Aerospace)



# Dual Enrollment at New Horizons



In Spring 2022, 22 high school students took UMS 107 as part of the dual enrollment Mechatronics Program at New Horizons.

# K-12 Innovation Grant Partnership - York County School Division and VPCC

- ▶ The partnership offers a dual enrollment program allowing high school students to earn the FAA Remote Pilot Certification and complete a Career Studies Certificate prior to high school graduation.
- ▶ Students will engage in work-based learning experiences.



# FAA Collegiate Training INITIATIVE

- ▶ New program designed by the FAA to recognize institutions that prepare students for careers in UAS or drones.
- ▶ Ensures that UAS-CTI school graduates have the knowledge and skills needed to pursue a successful career in an UAS-related field.





# Student Success Stories

# KURT WALKER

REMOTE DRONE PILOT

I just want to take the opportunity to share some great news with you all. **I recently became a member of the Drone Up team, serving as field maintenance pilot in Virginia Beach. I work with research and development and testing and implementation specialists, with the specific charge to successfully execute the Walmart drone delivery services that will operate nationwide within the next few years.** I really enjoy my position. I believe that what I learned as a student at VPCO helped fundamentally prepare me to fulfill my responsibilities well.

Thank you all so much for a great learning experience. I wish you all the best.

- September 2022



# From Students to Employees

- ▶ Jayda, Bryan, and Kurt – DroneUp
- ▶ Mark – Safety and Operations, The LongBow Group
- ▶ Chris – Advanced Aircraft Co. (Unique Propulsion >6 times battery life)
- ▶ Jeremy – Sea-based UAS that communicates with land-based operator
- ▶ Michael S. – Works for construction company to provide aerial views
- ▶ Michael G. – Asset Manager for Commercial Loan & Real Estate Advisory Co.
- ▶ John – Started company to monitor and film golf courses
- ▶ 4 NASA Employees – Working on the SAND Demonstration Project
- ▶ Ernie – Digital Air (Aerial Photography company)
- ▶ David – Started business to work with insurance companies and FEMA





**Thank You**

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