Virginia State University
College of Engineering & Technology
Talent Pipeline
• Total enrollment 5,000
• *U.S. News & World Report* twice acknowledged VSU as the top, public, master’s level HBCU in America. We are one of Virginia’s two lands grant institutions.
• 236-acre main campus, with more than 50 buildings, including 16 dormitories and 17 classroom buildings, and a 416-acre agricultural research facility.
College of Engineering & Technology

Dept. of Mathematics & Economics

- Economics BS & MS (65 majors)
- Mathematics BS & MS (75 majors)
College of Engineering & Technology

Dept. of Engineering & Computer Sciences
- Computer Engineering (135 majors)
- Manufacturing Engineering (60 majors)
- Computer Sciences
  BS & MS (150 majors)

Dept. of Technology
- Mech. Engr. Tech
  (100 majors)
- Electronics Engr. Tech
  (70 majors)
- Information Logistics Tech
  (60)
Core Competencies:

a. Unmanned and Autonomous Technology
b. Sensor Networks/ Cyber Security
c. Friction Stir Welding
d. Machine Learning & Inference Algorithms
e. Big Data Analytics & ERP Systems
f. Game Theory and System Optimization
A New Model for Collaboration

Key Attributes of CCAM and CCALS

- Industry-driven
- Multiple Universities
- Global Corporations
- Government Members
- Translational Research
- Workforce Development
- Enabler of Federal Funding
- Focus in Major Economic Sectors for Virginia

CCAM - Commonwealth Center for Advanced Manufacturing

CCALS - Commonwealth Center for Advanced Logistics Systems

Founded in May 2010

Founded in December 2012
Why VSU’s focus on Logistics?

Virginia is a hub of logistics
- Port of Virginia (POV)
- Interstates 95, 85, 64
- Commercial Airports
- Pentagon, Ft Belvoir, Ft Lee
Industry Driven Workforce Model

- **Engineering & Technology Curricula**
- **K-12 Partnerships**
- **ABET IEEE, ASME NSBE, SME**
- **VSU Programs**
- **Internships & Industry Certifications**
- **Workforce Readiness Levels**
- **CCAM/AMIE Partners**
- **Assessment Methods and Analysis**
- **Global Standards and Best Practices**

**Key Features**
- Industry-driven
- Industry-recognized certifications
- Stackable credentials
- Industry-ready experience
- Globally relevant

**CCAM Industry Members**

**Future Jobs and Required Skills**

**CCAM/AMIE Workforce Team**

**Education and Training Curricula**

**Workforce Pipeline**
VSU’s Talent Pipeline Model

Talent Transitions:
C21 = Freshman Talent Function \( f_{FT}(FA, PM, T, CR, SPS, I) \)
C32 = Sophomore Talent Function \( f_{ST}(FA, PM, I, IM, URE, T, SPS) \)
C43 = Junior Talent Function \( f_{JT}(FA, I, URE, IM, SPS, PM*) \)

Attributes:
FA= Advising, PM = Peer Mentoring, IM = Industry Mentoring ,CR = Calculus Readiness, T = Tutoring, SPS = Student Professional Societies, I = Internships, URE = Undergraduate Research Experiences.

* Mentor
Key Attributes that Foster Movement Along the Pipeline

- Peer Mentoring
- Research Experiences
- Internships
Our workforce vision in context

We compete in a capability space. Programs deliver outcomes/capabilities for a workforce.

Our key capabilities in context are as follows:

a. ERP Systems (SAP, PLM, ArcGIS, Orbis, CCALS)
b. Unmanned Vehicles (Drones partnership with Hazon & Dominion VA, CCALS)
c. Big Data, machine learning, IoT, cyber-security (CCAM)
d. Game Theory and Workforce System Optimization (CCAM)
Integrate Value Mapping into various stages of the Manufacturing through OMPS/SAP Integration
Integrate value mapping throughout Design, Analysis, and Manufacturing

Analysis of stress

Analysis of Energy
Demonstrate data-to-decisions along the value chain
Demonstrate OMPS/SAP, PLM Capabilities through the SAE Formula Car Competition

1. CNC Mill and Lathe – PLM/OMPS/SAP
2. FEA, CAD, CAM, 3D Print Rapid Prototype
3. Fabricate components for the suspension
4. Install components and test during competition
Drone Technology: I-o-T Demonstration

- Adaptive control for obstacle avoidance and system health
Va. Power tests drones to inspect power lines

Camera-equipped devices could replace helicopters

BY JOHN RAMSEY  Richmond Times-Dispatch

Small aerial drones equipped with high-tech cameras soon will begin flying missions to inspect high-voltage power lines for Dominion Virginia Power.

The utility, which has been testing unmanned aircraft at its Chester training facility since last year, sees the drones having the potential to replace helicopters commonly used to inspect transmission lines.

“Providing an alternative to the current use of helicopters, the use of self-piloted drones adds value to our inspection work,” said Steven A. Eisenbeis, Dominion Virginia Power's manager of electric transmission lines and line services.

“The utility, which has been testing unmanned aircraft at its Chester training facility since last year, sees the drones having the potential to replace helicopters commonly used to inspect transmission lines.”

“Providing an alternative to the current use of helicopters, the use of self-piloted drones adds value to our inspection work,” said Steven A. Eisenbeis, Dominion Virginia Power's manager of electric transmission lines and line services.

“We’re hoping to be able to provide more reliable service, to find issues on the line and correct them ahead of time,” he said.

Federal regulations require the drones to fly no higher than 200 feet and always within the pilot's line of sight. Dominion Virginia Power is working with three vendors that already have Federal Aviation Administration approval to fly drones for commercial use, including Hazen Solutions of Virginia Beach.

Each 25- to 30-pound drone is flown using a two-person team, with one controlling the flight and the other scanning the area for any safety concerns and operating the camera.

They typically hover 50 to 15 feet from the transmission towers, where their cameras can scan with enough precision to read the name plates on individual parts.

Eisenbeis said Dominion Virginia Power eventually hopes to use drones after storms to determine exactly where and how lines are damaged before sending in repair crews.

“Drones allow us to inspect miles of lines that would be nearly impossible from a helicopter or from a line worker.”

Drones have been used for years by the military for bombing and surveillance missions. Companies have started exploring their use in commercial settings, which unlike commercial uses currently are banned by the FAA except for the companies such as Hazen Solutions that have been granted special waivers.

“Amazon.com this year announced that it was working on technology that would allow drones to deliver packages to customers within 30 minutes.”

And last week in Wise County, two drones delivered medical supplies to an annual health clinic.

The FAA is working on rules expected to be released by the end of this year to help balance innovation with safety.

David Callis, CEO of Hazen Solutions, said the services drones can offer to various businesses are varied, especially if federal regulations become less stringent and allow drones to bring more commonplace.

“The only limitation is going to be our imagination in the future,” Callis said.

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Thank You !!!

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