

DRONE TECH

EDUCATORS WORKSHOP

“The Drone Build”

August 6-8, 2018

Northland Aerospace Campus

13892 Airport Drive
Thief River Falls, MN 56701

Northland Aerospace has led Unmanned Aircraft Systems and Geospatial Information Technology (UAS and GIT) educational developments since 2010 with the launch of the nation’s first UAS Maintenance Training Program. Northland Aerospace, currently has the only 2-year Geospatial Intelligence Analysis degree program and launched a small UAS Field Service Technician degree program in 2017.

Northland has also been awarded multiple National Science Foundation Advanced Technological program projects in partnership with St Cloud State University. These programs are leading the way in developments across Minnesota State College and University System (MinnState) as well as across the nation. With the most recent NSF award Northland and SCSU are proud to announce increased support for the DroneTECH Educator Workshops funded by the NSF ATE program.

What: Northland Aerospace DroneTECH 3-Day Educator Workshop “The Drone Build”

Who: Secondary and Post-Secondary Instructors Teaching in STEM Related Disciplines With Interest in Learning the Basics of Small Unmanned Aircraft Systems.

Topic: Participants will build drones from kits and learn what makes them tick. This Workshop Provides a High Level Overview of Many Aspect of Drone Technology. Topics and Activities to be Covered Include; Basic Parts, Components and Functions, Mission Planning and Flying, Practical Geospatial Applications.

When: August 6-8, 2018

Where: Northland Aerospace Site

Application and more information: www.northlandaerospace.com/dronetech

Travel: Community colleges are expected to cover the cost of transportation to the workshop (Northland’s Aerospace Site). However, participants may receive up to a \$700 reimbursement for attending the workshop that will help cover associated travel cost.

Requirements for Reimbursement: The workshop is available to secondary and post-secondary faculty teaching in STEM related disciplines. Reimbursement for travel expenses requires participants to provide a plan of action for curriculum that will result in course development based on the workshop activities. This may be demonstrated through the following:

- Attending the DroneTECH Educator Workshop.
- Providing plans for development of courses and pathways at your institution relating to UAS and GIT.
- Participating in the mentoring network for additional UAS and GIT faculty development.
- Leading organizational policy development for safe and legal integration of UAS at your home institution.

- Publicizing the use of UAS to increase UAS and GIT enrollment in both your service region and across the state and region.

Receiving University Graduate Credit

OPTIONAL: If you wish to receive 2 semester hour credits, available through Fresno Pacific University, you will need to:

- Bring a check payable to Fresno Pacific University in the amount of \$140.
- Complete a registration form on the first day of the course.
- Complete the assigned homework
 - Evaluation Criteria for Credit:
 - Attendance and participation, including in-class discussion (35%)
 - Instructor appraisal of performance: successful completion of building and configuration stage (35%)
 - Written paper on classroom implementation (30%) that will:
 - Describe the teacher’s audience (grade level, school and community context, class size).
 - Outline a plan for teaching physics, engineering and computer science concepts with UAVs
 - OR
 - Identify what industries and careers are available in their district’s economic region that could integrate or be aided by UAV systems.
 - Outline a plan for tailoring a UAV course to those applications.
 - Identify physical, human, and professional development resources available to the teacher
 - Outline a plan for managing the materials
 - Outline a plan for assessing and grading students
 - Anticipate and list potential problems that may need to be addressed
 - (Special attention given to FAA laws and liability concerns for UAVs in schools)
 - Articulate how students could use/apply/showcase their acquired skills beyond the classroom (competitions, maker events, science fairs, performing arts, etc.)

You will turn in your completed assignment by emailing it to mmatz@parallax.com

Schedule of Topics & Assignments

9:00AM-4:30PM Daily

DAY 1: Introduction to UAVs

- Overview of the ELEV8 v3 Quadcopter System
 - Airframe

- Electrical system
- Control system
- Building the ELEV8 v3
- Introduction to the Ground Station Software
- Flight physics and viewing sensor output
- Discussion of student learning and classroom implementation
- Description of written assignment

DAY 2: Flight School

- UAV safety for operators and observers
- Transmitter controls- Throttle (Thrust), Rudder (Yaw), Elevon (Pitch), Aileron (Roll), Gear (Mode), Aux (User defined)
- Preflight checklists
- Power-up procedures
- Flight basics
- Post-flight checklists
- Battery charging and safe storage
- What insights were gained after flying?
- Mission Planning
- Laws and Regulations
- Discussion of the written assignment classroom implementation

DAY 3: UAVs in the Workforce and Community

- Imagery Analysis
- Geospatial Intelligence
- Potential commercial applications
 - Aerial Imaging/Photography
 - Surveying/Mapping
 - Agriculture
 - Delivery/Logistics
 - Inspection
 - Search and Rescue
 - Wildlife/Biome Monitoring
 - Archaeology
 - Security and Surveillance
- ELEV8 v3 modification and customization
 - Camera Mounting and control
 - Lighting
 - Servo Actuator