

**Course Outline**

COURSE: AMT 228                      DIVISION: 50                      ALSO LISTED AS:

TERM EFFECTIVE: Spring 2019                      CURRICULUM APPROVAL DATE: 05/14/2018

SHORT TITLE: DRONE MAINT TECH

LONG TITLE: Drone Maintenance Technician

Units	Number of Weeks		Contact Hours/Week		Total Contact Hours
3	18	Lecture:	2	Lecture:	36
		Lab:	3	Lab:	54
		Other:	0	Other:	0
		Total:	5	Total:	90

**COURSE DESCRIPTION:**

This course is designed to provide students with the skills to maintain and repair drones. Emphasis is on the various systems, including the fuel, electrical, flight control and power plant systems as well as digital central processor assembly and system support equipment. Also covers system performance criteria, operational safety, inspection techniques and diagnosis of the drone. PREREQUISITE: AMT 225

**PREREQUISITES:**

Completion of AMT 225, as UG, with a grade of C or better.

**COREQUISITES:**

CREDIT STATUS: D - Credit - Degree Applicable

**GRADING MODES**

- L - Standard Letter Grade
- P - Pass/No Pass

REPEATABILITY: N - Course may not be repeated

**SCHEDULE TYPES:**

- 02 - Lecture and/or discussion
- 03 - Lecture/Laboratory
- 04 - Laboratory/Studio/Activity
- 04A - Laboratory - LEH 0.65
- 05 - Hybrid

**STUDENT LEARNING OUTCOMES:**

1. Describe and perform maintenance and repair on various drone systems; including the power plant, fuel system, flight control system and electrical power system; to ensure airworthy conditions.

Measure of assessment: exam, discussion, demonstration

Year assessed, or planned year of assessment: 2018

Semester: Spring

2. Describe, diagnosis and demonstrate the maintenance and repair of on-board communication, GPS and data systems that link the drone to the ground control station.

Measure of assessment: exam, discussion, homework, demonstration

Year assessed, or planned year of assessment: 2018

**CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS**

Curriculum Approval Date: 05/14/2018

Lecture content:

6 Hours:

- 1) Types of Drones - Rotor-wing and Fixed wing
- 2) Tools Used for Drone Maintenance and Repair

Student Performance Objectives: Identify the primary systems and vehicles being utilized in the drone industry and their correct vehicle/system classification and function. Identify the tools used for the repair and maintenance of drone systems.

9 Hours:

- 3) Types of Ground Control Stations and Maintenance
- 4) GPS, Sense and Avoid Sensors
- 5) Basic Navigation and Communications Systems

Student Performance Objectives: Explain the maintenance and repair of ground control stations. Discuss the types of ground control stations. Describe the installation and maintenance of drone computer networking systems. Identify and discuss the various types of sensors. Describe the various navigation and communication systems.

9 Hours:

- 6) Drone General Field Maintenance
- 7) Fabrication Materials
- 8) Aircraft Components
- 9) Flight Control Surfaces

Student Performance Objectives: Explain the principles for troubleshooting drone maintenance tasks. Identify the different types of fabrication materials, the various aircraft components and the flight control surfaces.

10 Hours:

- 10) Propulsion, Fuel and Electrical Systems
- 11) Batteries - Maintenance and Disposal

Student Performance Objectives: Describe the maintenance and repair of the propulsion, fuel and electrical systems for drones. Explain the proper use and disposal of the batteries used by drones.

2 Hours:

Final

Lab Content:

9 Hours:

- 1) Safety
- 2) Use of Tools for Drone Maintenance and Repair

Student Performance Objectives: Describe and apply the appropriate safety procedures for working on drone systems. Demonstrate the care and proper use of the tools related to the maintenance of both fixed wing and rotor-wing drones.

13.5 Hours:

3) Service of Ground Control Stations

4) GPS, Sense and Avoid Sensors Maintenance and Repair

5) Basic Navigation and Communications Systems Maintenance and Repair

Student Performance Objectives: Demonstrate the maintenance and repair of ground control stations. Configure, install and maintain drone computer networking operating systems. Maintain and repair communication/data systems linking drones to ground control stations.

13.5 Hours:

6) Drone General Field Maintenance

7) Fabrication Materials Maintenance and Repair

8) Aircraft Components Maintenance and Repair

9) Flight Control Surfaces Maintenance and Repair

Student Performance Objectives: Demonstrate the principles for troubleshooting drone maintenance tasks. Perform the maintenance and repair on different fabrication materials, various aircraft components and flight control surfaces.

15 Hours:

10) Propulsion, Fuel and Electrical Systems Maintenance and Repair

11) Batteries - Maintenance and Disposal

Student Performance Objectives: Diagnosis and perform aircraft maintenance and repair on propulsion, fuel and electrical systems using the technical information provided by the various drone manufacturers manuals. Demonstrate the proper use and disposal of batteries used for drones.

2 Hours:

#### **METHODS OF INSTRUCTION:**

lecture, discussion, demonstration, guided practice, multi-media

#### **OUT OF CLASS ASSIGNMENTS:**

Required Outside Hours: 12

Assignment Description: Read related textbook chapter(s) and/or assigned material(s). Review safety procedures and tools related to the repair and maintenance of drones.

Required Outside Hours: 20

Assignment Description: Read related textbook chapter(s) and/or assigned material(s). Project/Problem-Solving Assignment: The GPS navigation system failed on your rotor-wing drone. Troubleshoot the system and report on the necessary components required to repair the problem.

Required Outside Hours: 20

Assignment Description: Read related textbook chapter(s) and/or assigned material(s). Project/Problem-Solving Assignment: Select a fabrication material or an aircraft component and troubleshoot its repair/maintenance.

Required Outside Hours: 20

Assignment Description: Read related textbook chapter(s) and/or assigned material(s). Homework: Select the propulsion, fuel or electrical system and write a 1 page paper describing the process you would follow to troubleshoot the system.

#### **METHODS OF EVALUATION:**

Writing assignments

Percent of total grade: 10.00 %

Homework

Problem-solving assignments

Percent of total grade: 30.00 %

Report, Demonstration  
Skill demonstrations  
Percent of total grade: 40.00 %  
Demonstration  
Objective examinations  
Percent of total grade: 20.00 %  
Written exams

**REPRESENTATIVE TEXTBOOKS:**

Recommended Representative Textbooks  
Fahlstrom, Paul and Gleason, Thomas. Introduction to UAS Systems. John Wiley and Sons, Ltd.,2016.  
ISBN: 978-81-265-6014-1  
Reading Level of Text, Grade: 12th Verified by: MS Word  
Mark LaFay. Drones for Dummies. Hoboken, NJ: Wiley Publishing,2015.  
ISBN: 978-1-119-04978-4  
Reading Level of Text, Grade: 10th Verified by: MS Word  
Required Other Texts and Materials  
Various manuals connected to the individual drones.  
Software such as: Portable Hard Drive and Mini Scan Disks.

**ARTICULATION and CERTIFICATE INFORMATION**

Associate Degree:  
CSU GE:  
IGETC:  
CSU TRANSFER:  
    Not Transferable  
UC TRANSFER:  
    Not Transferable

**SUPPLEMENTAL DATA:**

Basic Skills: N  
Classification: Y  
Noncredit Category: Y  
Cooperative Education:  
Program Status: 1 Program Applicable  
Special Class Status: N  
CAN:  
CAN Sequence:  
CSU Crosswalk Course Department:  
CSU Crosswalk Course Number:  
Prior to College Level: Y  
Non Credit Enhanced Funding: N  
Funding Agency Code: Y  
In-Service: N  
Occupational Course: C  
Maximum Hours:  
Minimum Hours:

Course Control Number: CCC000582752

Sports/Physical Education Course: N

Taxonomy of Program: 095000