DRONE TECHNOLGIES 3
ACTIVITY COURSE CODE: 57T3

COURSE DESCRIPTION: In the Drone Technologies 3 course, students will be introduced to basic/advanced flight of drones to include manual flight and programmed flight with mapping software. Students will develop drone piloting knowledge and skills needed to obtain an FAA Remote Pilot certification. They will participate in drone mission planning, basic to advanced flight operations, and drone aircraft maintenance; execute communication needed as a flight crew team member. Lastly, students will gain the knowledge, skills, and industry credentials for careers in drone technology.

Minimum 16 age requirement for enrollment by the end of the course due to FAA Part 107 U.S. Commercial Drone Pilot Certification testing age requirement.

OBJECTIVE: Given the necessary equipment, materials, and instruction, students, on completion of the prescribed course of study, will be able successfully accomplish the following core competencies.

COURSE CREDIT:	1 (120 hours) credit
PRE-REQUISITE:	Drone Technologies 2
RESOURCES:	See Materials and Resources
COMPUTER ACCESS:	1 computer per student
MAXIMUM ENROLLMENT:	16 per instructor

A. BASIC / ADVANCED DRONE FLIGHT

Drone Technology students demonstrate appropriate knowledge and skills in basic and advanced flight of drones. The following accountability criteria are considered essential for students in preparing for the pre-professional Drone Technology program of study.

1. Define aerodynamics.
2. Discuss the history of flight.
3. Define Newton's Laws of Force and Motion.
4. Analyze how Newton's Laws of Force and Motion apply to airplanes and drones.
5. Identify how Bernoulli's Principle expanded on Newton's
6. Differentiate between the Laws of Force and Motion.
7. Define the three axes of flight.
8. Understand airspace regulations.
9. To define the different classes of airspace.
10. Analyze controlled versus uncontrolled airspace.
11. Analyze the equation for nautical and statute miles.
12. Define different weather factors for drone flight.
13. Define pilot-in-command and remote-pilot-in-command.

14. Analyze the four forces of flight.
15. Identify the three important control surfaces involved in the mechanical design of an airplane.
16. Analyze how multicopters fly.
17. Define how vectors are applied to flight characteristics.
18. Understand how to calculate values of combined maneuvers.
19. Assess knowledge regarding basics of flight.
20. Analyze beneficial first drones for beginners.
21. Understand how to work with lightweight drones.
22. Define propeller awareness and safety assurances.
23. Understand the basics of a controller.
24. Define the two modes.
25. Understand maneuvering terminology.
26. Analyze flight modes in advanced sUAVs.
27. Analyze tasks to complete before flying.
28. Define and explain the four beginning flight skills.
29. Assess knowledge regarding beginning flight skills.
30. Understand how to achieve advanced flight skills.
31. Identify the advanced flight skills to accomplish.
32. Assess knowledge regarding advanced flight skills.
33. Analyze how to be responsible as an operator.
34. Analyze regulations for drone use.
35. Understand fly zones versus notify zones.
36. Understand the drone registering process.
37. Identify understand weather conditions to not fly in.
38. Understand safe flight clearance and safe flying locations.
39. Define recreational use.
40. Analyze the safety guidelines for sUAS recreational users.
41. Understand the type of drone needed based on the purpose.
42. Analyze configuration suggestions.
43. Determine the advantages and disadvantages of building versus buying.
44. Assess knowledge regarding common sense flying.
45. Understand the commonality of drones.
46. Analyze drone maintenance not required by the FAA but recommended by experts.
47. Understand how to create a pre-flight checklist.
48. Understand how to log flights.
49. Analyze how to document logs.
50. Understand lithium polymer battery care and maintenance.
51. Analyze charging tips.
52. Define accurate charging temperatures and rates.
53. Define battery puffing.
54. Assess knowledge regarding maintenance and battery care.

Shop and Personal Safety, Student Organizations, Technology Knowledge, Professional Knowledge, and personal qualities and employability skills are to be embedded through standard A.

SHOP AND PERSONAL SAFETY

Drone Technology students know the academic subject matter, including safety as required for proficiency within their area. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Drone Technology program of study.

1. Review school safety policies and procedures.
2. Review classroom safety rules and procedures.
3. Review safety procedures for using equipment in the classroom/lab/field.
4. Identify major causes of work-related accidents in the trucking environment.
5. Demonstrate safety skills in a classroom/work environment.

STUDENT ORGANIZATIONS

Drone Technology students know the academic subject matter, including professional development, required for proficiency within their area. They will use this knowledge as needed in their role. The following accountability criteria are considered essential for students in the Drone Technology program of study.

1. Identify the purpose and goals of a Career and Technology Student Organization (CTSO).
2. Explain how CTSOs are integral parts of specific clusters, majors, and/or courses.
3. Explain the benefits and responsibilities of being a member of a CTSO.
4. List leadership opportunities that are available to students through participation in CTSO conferences, competitions, community service, philanthropy, and other activities.
5. Explain how participation in CTSOs can promote lifelong benefits in other professional and civic organizations.

TECHNOLOGY KNOWLEDGE

Drone Technology students know the academic subject matter, including digital citizenship and the ethical use of technology as needed in their role. The following accountability criteria are considered essential for students in the Drone Technology program of study.

1. Demonstrate proficiency and skills associated with the use of technologies that are common in a specific occupation (e.g., keying speed).
2. Identify proper netiquette when using e-mail, social media, and other technologies for communication purposes.
3. Identify potential abuse and unethical uses of laptops, tablets, computers, and/or networks.
4. Explain the consequences of social, illegal, and unethical uses of technology (e.g., cyberbullying, piracy; illegal downloading; licensing infringement; inappropriate

uses of software, hardware, and mobile devices in the work environment).
5. Discuss legal issues and the terms of use related copyright laws, fair use laws, and ethics pertaining downloading of images, photographs, documents, video, sounds, music, trademarks, Creative Commons, and other elements for personal use.
6. Describe ethical and legal practices safeguarding the confidentiality of business- and personal-related information.
7. Describe threats a laptop, tablet, computer, and/or network and methods of avoiding attacks.
8. Evaluate various solutions common hardware and software problems.

PERSONAL QUALITIES AND EMPLOYABILITY SKILLS

Drone Technology students know the academic subject matter, including positive work practices and interpersonal skills, as needed in their role. The following accountability criteria are considered essential for students in the Drone Technology program of study.

1. Demonstrate creativity and innovation.
2. Demonstrate critical thinking and problem-solving skills.
3. Demonstrate initiative and self-direction.
4. Demonstrate integrity.
5. Demonstrate work ethic.
6. Demonstrate conflict resolution skills.
7. Demonstrate listening and speaking skills.
8. Demonstrate respect for diversity.
9. Demonstrate customer service orientation.
10. Demonstrate teamwork.

PROFESSIONAL KNOWLEDGE

Drone Technology students know the academic subject matter, including positive work practices and interpersonal skills, as needed in their role. The following accountability criteria are considered essential for students in the Drone Technology program of study.

1. Demonstrate global or “big picture” thinking.
2. Demonstrate career and life management skills and goal-making.
3. Demonstrate continuous learning and adaptability skills changing job requirements.
4. Demonstrate time and resource management skills.
5. Demonstrates information literacy skills.
6. Demonstrates information security skills.
7. Demonstrates information technology skills.
8. Demonstrates knowledge and use of job-specific tools and technologies.
9. Demonstrate job-specific mathematics skills.
10. Demonstrates professionalism in the workplace.
11. Demonstrates reading and writing skills.
12. Demonstrates workplace safety.