

Florida Department of Education
Curriculum Framework

Program Title: Unmanned Aircraft Systems (UAS) Operations
Program Type: Career Preparatory
Career Cluster: Transportation, Distribution and Logistics

Secondary – Career Preparatory

Program Number	9505100
CIP Number	0615080104
Grade Level	9 – 12
Standard Length	4 credits
Teacher Certification	Refer to the Program Structure section
CTSO	Technology Student Association, SkillsUSA
SOC Codes (all applicable)	17-3024 – Electro-Mechanical Technicians 49-3011 – Aircraft Mechanics and Service Technicians
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml

Purpose

The purpose of this program is to prepare students for employment and advanced educational training in the emerging aviation industry of unmanned aircraft systems (UAS). Instruction is designed to prepare students for Federal Aviation Administration (FAA) ground school examinations for Private Pilot rating. Federal Aviation Regulation (FAR) Part 61 identifies minimum requirements for completing this examination, which is required to complete the FAR Part 107 examination to achieve a Remote Pilot License. This program prepares students for employment in the field of UAS both as a Pilot, Operations Technician, and a Line-of-Sight Observer.

This program focuses on broad, transferable skills, stresses understanding of all aspects of the UAS growing industry, and demonstrates elements of the industry such as planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues, and health, safety, and environmental issues.

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of two occupational completion points.

The following table illustrates the Secondary program structure:

OCP	Course Number	Course Title	Teacher Certification	Length	SOC Code	Level	Graduation Requirement
A	9540610	Private Pilot Ground School	AIR MECH @7 7G AVIONICS @7 7G	1 credit	49-3011	3	
B	9505110	Unmanned Aircraft Systems (UAS) Operations 1	AEROSPACE 7G ENG TEC 7G	1 credit	17-3024	3	
	9505120	Unmanned Aircraft Systems (UAS) Operations 2	TEC ED 1@2	1 credit	17-3024	3	
	9505130	Unmanned Aircraft Systems (UAS) Operations 3	ENG&TEC ED1@2	1 credit	17-3024	3	

(Graduation Requirement Abbreviations- EQ= Equally Rigorous Science, PA= Practical Arts, EC= Economics)

Academic Alignment Table

Academic alignment is an ongoing, collaborative effort of professional educators specializing in the fields of science, mathematics, English/language arts, and Career and Technical Education (CTE). This initiative supports CTE programs by improving student performance through the integration of academic content within CTE courses. Career and Technical Education courses that have been aligned to the Next Generation Sunshine State Standards for Science and the Florida Standards for Mathematics and English/Language Arts will show the following data: the quantity of academic standards in the CTE course; the total number of standards contained in the academic course; and the percentage of alignment to the CTE course.

Courses	Anatomy/ Physiology Honors	Astronomy Solar/Galactic Honors	Biology 1	Chemistry 1	Earth-Space Science	Environmental Science	Genetics	Integrated Science	Marine Science 1 Honors	Physical Science	Physics 1
9540610	**	**	**	**	**	**	**	**	**	**	**
9505110	**	**	**	**	**	**	**	**	**	**	**
9505120	**	**	**	**	**	**	**	**	**	**	**
9505130	**	**	**	**	**	**	**	**	**	**	**

** Alignment pending review

Alignment attempted, but no correlation to academic course

Courses	Algebra 1	Algebra 2	Geometry	English 1	English 2	English 3	English 4
9540610	**	**	**	**	**	**	**
9505110	**	**	**	**	**	**	**
9505120	**	**	**	**	**	**	**
9505130	**	**	**	**	**	**	**

** Alignment pending review

Alignment attempted, but no correlation to academic course

Florida Standards for Technical Subjects

Florida Standards (FS) for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects are the critical reading and writing literacy standards designed for grade 6 and above. These standards are predicated on teachers of history/social studies, science, and technical subjects using their content area expertise to help students meet the particular challenges of reading, writing, speaking, listening, and language in their respective fields. The FS for Mathematical Practices are designed for grades K-12 and describe varieties of expertise that educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education.

Instructors must incorporate the Florida Standards for Technical Subjects and Mathematical Practices throughout instruction of this CTE program. To access these standards, please click on the following link:

<http://www.fldoe.org/core/fileparse.php/5652/urlt/FloridaStandardsTechSubjects.rtf>.

Florida Standards for English Language Development (ELD)

English language learners communicate for social and instructional purposes within the school setting. ELD.K12.SI.1.1

English Language Development (ELD) Standards Special Notes:

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate for social and instructional purposes within the school setting. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL’s need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: <http://www.cpalms.org/uploads/docs/standards/eld/SI.pdf>.

For additional information on the development and implementation of the ELD standards, please contact the Bureau of Student Achievement through Language Acquisition at sala@fldoe.org.

National Standards

Programs identified as having Industry or National Standards to the corresponding standards and/or benchmarks for the Unmanned Aircraft Systems (UAS) Operations program can be found using the following link:

<https://www.faa.gov/uas/>

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of safe and effective work practices.
- 02.0 Demonstrate an understanding of fundamentals of flight.
- 03.0 Understand and explain Federal Aviation Administration Regulations.
- 04.0 Demonstrate understanding of meteorology.
- 05.0 Demonstrate knowledge of aircraft communication equipment.
- 06.0 Demonstrate knowledge and understanding of aircraft propulsion and associated systems.
- 07.0 Demonstrate an understanding of navigation systems and procedures.
- 08.0 Demonstrate flight planning skills.
- 09.0 Demonstrate effective communication skills.
- 10.0 Demonstrate analytical skills.
- 11.0 Demonstrate understanding of applied sciences.
- 12.0 Describe human factors related to safe aircraft operation.
- 13.0 Describe the flight training process.
- 14.0 Describe aircraft safety of flight principles.
- 15.0 Describe the Airport Environment.
- 16.0 Demonstrate an understanding of the basics of unmanned aerial systems (UAS).
- 17.0 Demonstrate an understanding why safety considerations and regulations are necessary.
- 18.0 Understand the basic rules of safe operations.
- 19.0 Demonstrate an understanding of the principles of flight.
- 20.0 Understand UAS propulsion and power.
- 21.0 Understand the types of control.
- 22.0 Understand material science.
- 23.0 Understand core components and assembly.
- 24.0 Demonstrate and execute basic UAS operations.
- 25.0 Demonstrate understanding of regulations and aeronautics principles
- 26.0 Demonstrate understanding of mission planning, preparation, execution, and post flight debrief.
- 27.0 Review current regulations.
- 28.0 Describe potential impacts from UAS operations.
- 29.0 Demonstrate and execute troubleshooting.
- 30.0 Demonstrate and execute maintenance.
- 31.0 Understand aeronautical principles.
- 32.0 Understand weather and weather reporting.
- 33.0 Execute mission planning.
- 34.0 Demonstrate a practical application of mission planning.
- 35.0 Demonstrate and execute mission preparation and UAS design.
- 36.0 Demonstrate and execute advanced UAS construction.
- 37.0 Create and execute mission flight plan.
- 38.0 Analyze and evaluate the mission.

**Florida Department of Education
Student Performance Standards**

Course Title: Private Pilot Ground School
Course Number: 9540610
Course Credit: 1

Course Description:

The Private Pilot Ground School course prepares students for entry into the aviation industry. Students explore career opportunities and requirements of a professional aviation pilot/mechanic. Students study general shop safety, fundamentals of flight, FAA regulations, meteorology, aircraft communications, propulsion, and navigation systems, flight planning, communication and analytical skills, applied sciences, safe aircraft operation and principles, flight training processes, and airport environments.

Abbreviations:

FS-M/LA = Florida Standards for Math/Language Arts
 NGSSS-Sci = Next Generation Sunshine State Standards for Science

Note: This course is pending alignment in the following categories: FS-M/LA, NGSSS-Sci, and FAA

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci	FAA FAR Part 61
01.0 Demonstrate an understanding of safe and effective work practices.- The student will be able to:			
01.01 Demonstrate an awareness and understanding of fueling operations.			
01.02 Demonstrate an understanding of situational awareness.			
01.03 Demonstrate an awareness and understanding of fire hazards, and how to control and extinguish fires.			
01.04 Demonstrate an awareness and understanding for the need of safety devices, controls, guards and equipment.			
02.0 Demonstrate an understanding of fundamentals of flight.-The student will be able to:			
02.01 Name and compare the four forces of flight.			
02.02 Describe the structural components of an aircraft.			
02.03 Describe airfoil design factors.			
02.04 Explain how an airfoil produces lift using Bernoulli’s principles and Newton’s Laws of Force and Motion.			

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci	FAA FAR Part 61
02.05 Discuss how and why an airplane stalls and spins.			
02.06 Describe the function of aircraft flight controls and their effect on aircraft pitch, roll, and yaw.			
02.07 Describe and explain the operation and use of pitot/static, vacuum/gyroscopic, pressure and engine instruments.			
02.08 Explain factors affecting aircraft design, performance, and operation.			
03.0 Understand and explain Federal Aviation Administration Regulations.- The student will be able to:			
03.01 Explain major portion of Parts 1, 61, 91, 135, 141 and NTSB 830 of the Federal Aviation Regulations.			
04.0 Demonstrate understanding of meteorology.-The student will be able to:			
04.01 Describe the composition, circulation and stability of the atmosphere.			
04.02 Demonstrate an understanding of air mass development, the movement of fronts and their effect on aviation.			
04.03 Demonstrate an awareness of weather hazards to aviation and an understanding of how to avoid them.			
04.04 Demonstrate the ability to access weather information prior to and during flights through a variety of media.			
04.05 Interpret printed reports, forecasts and graphic weather products.			
05.0 Demonstrate knowledge of aircraft communication equipment.-The student will be able to:			
05.01 Use and explain aircraft voice communication equipment.			
05.02 Explain function and use of ELT's, voice recorders, and other emergency communication systems.			
05.03 Demonstrate use of proper phraseology in ATC communications.			
05.04 Discuss uses and limitations of portable transceivers.			
05.05 Demonstrate use of phonetic alphabet.			
06.0 Demonstrate knowledge and understanding of aircraft propulsion and associated systems.-The student will be able to:			
06.01 Describe and identify reciprocating and turbine engine components.			

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci	FAA FAR Part 61
06.02 Compare the merits of fixed and variable pitch propellers.			
06.03 Describe a typical lubrication system.			
06.04 Describe a typical aircraft electrical system, including a magneto ignition systems and proper magneto checks.			
06.05 Describe the difference between a normally aspirated engine and one that is supercharged or turbocharged.			
06.06 Describe the difference between gravity fed and pump fed fuel systems.			
06.07 Demonstrate basic operation of an aircraft engine, including proper interpretation of instruments and use of appropriate engine controls.			
07.0 Demonstrate an understanding of navigation systems and procedures.- The student will be able to:			
07.01 Distinguish between latitude and longitude.			
07.02 Define radio navigation.			
07.03 Explain the operation of the magnetic compass, including compass errors.			
07.04 Describe and demonstrate use of VOR equipment and navigation.			
07.05 Describe the operation of GPS navigation equipment.			
07.06 Explain DME principles.			
07.07 Explain sectional charts and their use.			
07.08 Explain lost communications emergency procedures under VFR.			
07.09 Plot and explain a route of flight.			
07.10 Differentiate different classes of airspace and usage within the FAA national airspace system.			
08.0 Demonstrate flight planning skills.-The student will be able to:			
08.01 Explain major portions of Parts 1, 91 and NTSB 830 of the Federal Aviation Rules and Regulations.			
08.02 Define weight and balance.			
08.03 Define center of gravity, moment, datum line, CG envelope,			

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci	FAA FAR Part 61
basic empty weight, and gross weight.			
08.04 Calculate, compute, and solve given weight and balance problems.			
08.05 Demonstrate acquisition of appropriate weather data.			
08.06 Demonstrate proper selection of destination/enroute/alternate airports.			
08.07 Explain fuel requirements.			
08.08 Read and interpret performance charts to predict aircraft performance.			
08.09 Demonstrate the use of a flight computer.			
08.10 Access and analyze NOTAMS.			
08.11 Define and describe the various phases of flight.			
08.12 Explain the function of a pilot logbook.			
08.13 Prepare a VFR flight plan.			
08.14 Demonstrate familiarity with various published sources of flight information (Airfield Directories, NOTAMS, Aeronautical Information Manual, and Advisory Circulars).			
09.0 Demonstrate effective communication skills.-The student will be able to:			
09.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.			
09.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.			
09.03 Read and follow written and oral English instructions.			
09.04 Answer and ask questions coherently and concisely.			
09.05 Demonstrate telephone/communication skills.			
09.06 Demonstrate knowledge and use of appropriate computer skills.			
09.07 Demonstrate interpersonal skills.			
10.0 Demonstrate analytical skills.-The student will be able to:			

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci	FAA FAR Part 61
10.01 Add, subtract, multiply and divide using fractions, decimals, whole numbers, percentages, and ratios.			
10.02 Demonstrate understanding and use of the metric system.			
11.0 Demonstrate understanding of applied sciences.-The student will be able to:			
11.01 Draw conclusions or make inferences from data.			
11.02 Understand pressure measurement in terms of P.S.I., inches of mercury, and metric.			
12.0 Describe human factors related to safe aircraft operation.-The student will be able to:			
12.01 Describe effects of the flight environment on human physiology.			
12.02 Describe the effects of alcohol and drugs on human performance.			
12.03 Explain crew resource management (CRM).			
12.04 Describe situational awareness (SA).			
12.05 Describe aeronautical decision making (ADM) skills.			
13.0 Describe the flight training process.-The student will be able to:			
13.01 Define various pilot certificates and ratings (private, instrument, multi-engine, commercial, certified flight instructor (CFI/CFII/MEI), and airline transport pilot (ATP).			
13.02 List and describe both professional and non-professional aviation opportunities.			
14.0 Describe aircraft safety of flight principles.-The student will be able to:			
14.01 Summarize techniques of collision avoidance, including proper visual scanning and right of way rules.			
14.02 Describe minimum safe altitude (MSA) and preparation for flight over hazardous terrain.			
14.03 Describe proper ground taxi techniques.			
14.04 Summarize the airport traffic pattern (entry, altitudes, turns, legs, and departure).			
15.0 Describe the airport environment.-The student will be able to:			
15.01 Describe the configuration of airports, including runways			

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci	FAA FAR Part 61
taxiways markings and signs.			
15.02 Describe airport lighting (runways, taxiways, beacons, and approach lighting systems).			

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**Florida Department of Education
Student Performance Standards**

Course Title: Unmanned Aircraft Systems (UAS) Operations 1
Course Number: 9505110
Course Credit: 1

Course Description:

The Unmanned Aircraft Systems (UAS) Operations 1 course prepares students for entry into the UAS aviation industry. Students explore a basic understanding of the operational aspects that are key to the requirements that are necessary to be part of the professional UAS Aviation Industry. Students study general operational principles and flight safety requirements to perform mission flight profiles, environmental concerns, mathematics, physics, basic aerodynamics, federal aviation regulations, publications and required records.

Abbreviations:

FS-M/LA = Florida Standards for Math/Language Arts
 NGSSS-Sci = Next Generation Sunshine State Standards for Science

Note: This course is pending alignment in the following categories: FS-M/LA, NGSSS-Sci, and FAA

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci	FAA FAR Part 107
16.0 Demonstrate an understanding of the basics of unmanned aerial systems (UAS).-The student will be able to:			
16.01 Define UAS.			
16.02 Describe the development of UAS technology.			
16.03 Describe how UAS and their uses have changed over time.			
16.04 Categorize basic UAS types.			

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci	FAA FAR Part 107
16.05 Explain the role of UAS communities and networks.			
17.0 Demonstrate an understanding why safety considerations and regulations are necessary.-The student will be able to:			
17.01 Explain harm and damage from inappropriate use.			
17.02 Demonstrate basic understanding of restrictions of UAS flights.			
18.0 Understand the basic rules of safe operations.-The student will be able to:			
18.01 Describe appropriate locations and flight conditions.			
18.02 Describe basic requirements for safe operations.			
19.0 Demonstrate an understanding of the basic principles of flights.-The student will be able to:			
19.01 Identify the structure and components of a UAS aircraft.			
19.02 Explain the four forces of flight.			
19.03 Explain the basic characteristics of roll, pitch, and yaw.			
20.0 Understand UAS propulsion and power.-The student will be able to:			
20.01 Define and explain the two types of propulsion.			
20.02 Describe the function and types of batteries used with UAS.			
20.03 Describe the properties and functions of propellers.			
21.0 Understand the types of control.-The student will be able to:			
21.01 Describe and explain various levels of operator versus computer control.			
21.02 Identify and classify various communication methods.			
22.0 Understand material science.-The student will be able to:			
22.01 Compare and contrast different materials used in airframe construction.			
22.02 Describe and demonstrate soldering methods.			
23.0 Understand core components and assembly.-The student will be able to:			

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci	FAA FAR Part 107
23.01 Identify core components used in UAS.			
23.02 Select appropriate components for use in UAS.			
23.03 Identify tools and equipment for UAS assembly.			
23.04 Assemble and configure the assigned UAS.			
23.05 Test system preflight functionality.			
23.06 Install and configure external payloads.			
24.0 Demonstrate and execute basic UAS operations.-The student will be able to:			
24.01 Identify the components of the pre-flight checklist.			
24.02 Execute pre-flight check.			
24.03 Execute in-flight operations.			
24.04 Define the roles of a UAS flight-crew.			
24.05 Describe and explain the stages of flight: prep, takeoff, flight profile, landing, and recovery.			
24.06 Perform and execute responses to the proposed flight profile and recovery.			
24.07 Identify elements of the post flight-checklist.			
24.08 Execute post-flight check.			

**Florida Department of Education
Student Performance Standards**

Course Title: Unmanned Aircraft Systems (UAS) Operations 2
Course Number: 9505120
Course Credit: 1

Course Description:

The Unmanned Aircraft Systems (UAS) Operations 2 course prepares and introduces students to the flight operations associated with the UAS aviation industry. Students examine and explore the applicable of regulations at the Federal, State, and local level as they relate to UAS and manned flight operations. Students are also introduced to the unique governing aspects of flight operations conducted within the National Airspace System (NAS). This course includes introduction to flight navigation, weather, mission planning, software, hardware, and firmware associated with UAS activities. Students continue to examine the aspects associated with environmental concerns, mathematics, physics, advanced aerodynamics, publications, and required records keeping.

Abbreviations:

FS-M/LA = Florida Standards for Math/Language Arts
 NGSSS-Sci = Next Generation Sunshine State Standards for Science

Note: This course is pending alignment in the following categories: FS-M/LA, NGSSS-Sci, and FAA

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci	FAA FAR Part 107
25.0 Demonstrate understanding of regulations and aeronautics principles.- The student will be able to:			
25.01 Review and understand federal regulations that govern UAS operations.			
25.02 Research current state and local regulations that govern UAS operations.			
25.03 Describe current applications of UAS operations.			
25.04 Examine political, economic, and social impacts of UAS operations.			
25.05 Describe different classifications of airspace within the U.S.			
25.06 Identify the 24-hour clock and the associated phonetic alphabet.			
25.07 Identify features of an aeronautical charts.			
25.08 Describe and explain weather and weather reporting.			
25.09 Review and examine different mission planning.			

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci	FAA FAR Part 107
25.10 Develop flight planning dynamics using programmable software.			
25.11 Program and configure software flight plan.			
26.0 Demonstrate understanding of mission planning, preparation, execution, and post flight debrief.-The student will be able to:			
26.01 Organize and research the assigned mission.			
26.02 Develop a flight plan/profile with defined outcomes.			
26.03 Communicate mission flight plan/profile to flight crew.			
26.04 Use designed hardware and software to define mission flight plan/profile.			
26.05 Perform flight plan/profile briefing with Remote Pilot in Charge (RPIC) and flight crew.			
26.06 Execute flight plan/profile.			
26.07 Analyze and evaluate mission.			
26.08 Format and analyze mission data.			
26.09 Review mission and develop conclusions and present mission finding.			
26.10 Evaluate and critique mission results.			
27.0 Review current regulations.-The student will be able to:			
27.01 Review and Understand current federal regulations governing UAS operations.			
27.02 Research current state and local regulations governing UAS operations.			
28.0 Describe potential impacts from UAS operations.-The student will be able to:			
28.01 Research current applications of UAS operations.			
28.02 Explain political, economic, and societal impacts of UAS operations.			
28.03 Research UAS post-secondary training and careers.			
29.0 Demonstrate and execute troubleshooting.-The student will be able to:			
29.01 Establish and execute a troubleshooting theory.			

CTE Standards and Benchmarks	FS-M/LA	NGSSS-Sci	FAA FAR Part 107
29.02 Apply theory to solve common UAS hardware, software, firmware, and communications problems.			
30.0 Demonstrate and execute maintenance.-The student will be able to:			
30.01 Select and use appropriate maintenance tools.			
30.02 Demonstrate and execute in-flight tuning to meet performance requirements.			
30.03 Apply appropriate repair/maintenance procedures.			
31.0 Understand aeronautical principles.-The student will be able to:			
31.01 Identify and use phonetic alphabet and Zulu time.			
31.02 Define and classify designated airspace.			
31.03 Identify features and read aeronautical maps.			
32.0 Understand weather and weather reporting.-The student will be able to:			
32.01 Explain how weather impacts UAS operations.			
32.02 Explain and interpret weather reports.			
33.0 Execute mission planning.-The student will be able to:			
33.01 Select appropriate platform for a specific mission.			
33.02 Configure flight plan using appropriate programs and software.			
33.03 Configure transmitter and software for appropriate flight modes, and deploy.			

**Florida Department of Education
Student Performance Standards**

Course Title: Unmanned Aircraft Systems (UAS) Operations 3
Course Number: 9505130
Course Credit: 1

Course Description:

The Unmanned Aircraft Systems (UAS) Operations 3 course prepares students for executing mission planning and design elements necessary to prototype new industry standards to meet the changing mission requirements as technology continues to adapt and advance. Students explore advanced mission planning from basic organization to enhanced and complex flight profiles. Students study advance operational principles and UAS design and development to support new designs necessary to perform every changing mission flight profiles. This will include environmental concerns, mathematics, physics, basic aerodynamics, federal aviation regulations, publications, and required records.

Abbreviations:

FS-M/LA = Florida Standards for Math/Language Arts
 NGSSS-Sci = Next Generation Sunshine State Standards for Science

CTE Standards and Benchmarks		FS-M/LA	NGSSS-Sci	FAA FAR Part 61
34.0	Demonstrate a practical application of mission planning.-The student will be able to:			
34.01	Organize and research the mission.			
34.02	Develop a project plan with defined outcomes.			
34.03	Communicate a project plan with stakeholders, backers, and support agency.			
35.0	Demonstrate and execute mission preparation and UAS design.-The student will be able to:			
35.01	Use appropriate hardware and software to create UAS design.			
35.02	Assemble all components, software, and tools needed to build a prototype UAS for a designated mission profile.			
35.03	Identify basic and advanced setup for a UAS.			
36.0	Demonstrate and execute advanced UAS construction.-The student will be able to:			
36.01	Create and utilize a design to build, modify and enhance a UAS.			
36.02	Modify and adjust components and/or payload.			

CTE Standards and Benchmarks	FS-M/LA	NGSS-Sci	FAA FAR Part 61
36.03 Apply setup procedures to test, calibrate and optimize the UAS.			
37.0 Create and execute mission flight plan.-The student will be able to:			
37.01 Create a flight plan.			
37.02 Configure system for a specific flight plan.			
37.03 Execute a specific flight plan.			
38.0 Analyze and evaluate the mission.-The student will be able to:			
38.01 Format and analyze mission data.			
38.02 Draw conclusions and present mission findings.			
38.03 Describe and summarize mission with a wrap-up and debrief.			
38.04 Evaluate and critique mission results.			

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Classroom, shop, and laboratory activities are an integral part of this program. FAR Section 107.21(e) requires teaching of at least 50 percent of the curriculum in the shop or laboratory. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes found in the industry. Equipment and supplies should be provided to enhance hands-on experiences for students in the chosen occupation.

Special Notes

Refer to FAA FAR Part 61, 107 and industry publications for more information about required levels of proficiency, hours of instruction, and updates to occupational titles and training requirements. Keeping pace with the standards of industry and maintaining a high quality of training requires ongoing linkages with industry and FAA.

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student. Access MyCareerShines by visiting: www.mycareershines.org.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercultural career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations' plan to meet individual needs and ensure equal access. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE)) will need modifications to meet their needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note: postsecondary curriculum and regulated secondary programs cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular Occupational Completion Point (OCP) or a Modified Occupational Completion Point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number for eligible students with disabilities.

Additional Resources

For additional information regarding articulation agreements, Bright Futures Scholarships, Fine Arts/Practical Arts Credit and Equivalent Mathematics and Equally Rigorous Science Courses please refer to:

<http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml>