COLTON REDLANDS YUCAIPA
REGIONAL OCCUPATIONAL PROGRAM

2025-2026

Aviation 2

COURSE OUTLINE - UC

DESCRIPTION:

This advanced course is designed to deepen students' understanding of aviation, with a focus on preparing them for the FAA Private Pilot Knowledge Exam. Students will gain hands-on experience and practical skills necessary for flight training, including time spent in a certified FAA Redbird flight simulator. Instruction will cover key regulations outlined in 14 CFR 61.105(b). Upon successful completion of the course, students may be eligible for an endorsement and receive a certificate of completion, further advancing their aviation journey.

INFORMATION:

PRE-REQUISITE:	Aviation 1
LENGTH:	One Year
SECTOR:	Transportation
PATHWAY:	Systems Diagnostic and Service
ARTICULATED:	Yes
UC A-G APPROVAL:	Yes - College-Preparatory Elective (G) / Interdisciplinary

O*NET SOC CODES:

53-2011.00	Airline Pilots, Copilots, and Flight Engineers
49-2091.00	Avionics Technicians
53-2022.00	Airfield Operations Specialists
19-4099.03	Remote Sensing Technicians
53-2021.00	Air Traffic Controllers

Orientation

A. Introduce the course and facilities.
B. Discuss the syllabus and major objectives.
C. Explain applicable classroom management procedures, and any operational guidelines.
D. Review instructor/student expectations.
E. Explain attendance requirements and procedures.
F. Review grading and student evaluation procedures.
G. Discuss the work-based learning aspect of the program, if applicable.
H. Discuss the "next steps" related to additional education, training, and employment.
I. Review classroom safety, emergency and disaster procedures.

1. Communication Skills

A. Demonstrate positive verbal communication skills using appropriate vocabulary, demeanor, and vocal tone in the classroom and/or worksite.
B. Read and interpret written information and directions.
C. Practice various forms of written communication appropriate to the occupation.
D. Practice positive body language skills.
E. Practice professional verbal skills for resolving a conflict.
F. Demonstrate active listening skills including techniques for checking for understanding, and for obtaining clarification of directions.

2. Interpersonal Skills

A. Demonstrate positive teamwork skills by contributing to a group effort.
B. Practice the importance of diversity awareness and sensitivity in the workplace.
C. Define sexual harassment in the workplace and identify the employee's role and responsibility.
D. Practice participation skills.
E. Identify different personality types and demonstrate flexibility and adaptability working with diverse individuals.
F. Practice business and social etiquette skills appropriate to the occupation.
G. Evaluate and discuss the role of business and personal ethics in decision making based on various job-related scenarios.
H. Demonstrate the use of time management skills.

3. Employability Skills

A. Demonstrate appropriate attendance and punctuality practices for the classroom (and worksite, if applicable).
B. Prepare a resume, cover letter, and job application.
C. Demonstrate interviewing techniques in seeking employment, using appropriate tone, body language and professional dress and grooming standards.

D. Identify strategies for employment retention.
E. Identify and analyze sources of job information, including electronic sources and the impact of social networking on employability.
F. Identify the need for continuing education, professional development, and professional growth in chosen field.
G. Identify appropriate procedures for leaving a job.
H. Review company policies and current trends in employee compatibility screening, drug screening, and background checks.

4. Leadership

A. Define leadership and identify the responsibilities, competencies, and behaviors of successful leaders.
B. Work with peers to promote divergent and creative perspectives.
C. Demonstrate how to organize and structure work, individually and in teams, for effective performance and the attainment of goals.
D. Explain multiple approaches to conflict resolution and their appropriateness for a variety of situations in the workplace.
E. Employ ethical behaviors and actions that positively influence others.
F. Analyze the short-term and long-term effects a leader's actions and attitudes can have on productivity, morale, and organizational culture.

5. Personal and Occupational Safety

A. Demonstrate procedures to be followed in case of emergencies.
B. Describe and discuss the procedure for reporting a work-related hazard or injury (worker's comp), including ways to report a potential safety hazard to a supervisor.
C. Identify and discuss cyber ethics, cyber safety, and cyber security.
D. Apply personal safety practices to and from the job.
E. Recognize the effects of substance abuse in the workplace.
F. Explain the importance of CAL-OSHA in the industry.
G. Recognize good housekeeping and ergonomics as safety issues.
H. Identify safety hazards commonly found in the workplace environment.

6. Aviation History

A. Explain the history of aviation from 1939 to the present.
B. Discuss the Jet Age.
C. Explain historical trends and modern-day aviation.

7. Private Pilot Regulations, Privileges, Limitations, and Flight Operations

A. Identify Federal Aviation Regulations.
B. Explain the certification procedures for products and articales.
C. Discuss airworthiness directives.
D. Apply general operating and flight rules

E. Explain maintenance, preventive maintenance, rebuilding, and alterations.
F. Identify medical standards and certification.

8. Accident reporting and the NTSB

A. Define NTSB Part 830.
B. Understand the Role of the NTSB.
C. Explain the role of the Federal Aviation Administration (FAA).
D. Complete accident/incident reporting forms used by the NTSB and FAA.
E. Understand aviation accident investigation procedures.
F. Analyze aviation accident report and reporting protocols.
G. Understand the Federal Aviation Regulations (FARs) related to accident reporting and investigation.
H. Demonstrate knowledge of the legal implications of reporting and investigating accidents, including the role of the NTSB in determining cause and recommending corrective actions.

9. Aeronautical Chart/VFR Navigation

A. Explain VFR navigation charts.
B. Identify sectional chart symbology.
C. Discuss advisory circulars.
D. Identify chart supplements.
E. Recognize Notice to Airman System NOTAM.
F. Use flight computers and E6B/Electronic.
G. Apply speed, distance, and time calculations.
H. Explain fuel consumption.
I. Explain density altitude, true airspeed, and choosing altitudes/aircraft performance.
J. Define magnetic heading.
K. Explain wind direction and velocity.

10. Radio Communications

A. Discuss basic radio principles.
B. Explain air traffic control.
C. Explain airspace.

11. Advanced Critical Weather

A. Explain the earth’s atmosphere.

B. Define temperature.
C. Explain atmospheric pressure.
D. Identify wind.
E. Recognize moisture, cloud formation, and precipitation.
F. Discuss stable/unstable air.
G. Define air masses and fronts.
H. Identify turbulence.
I. Define icing thunderstorms.
J. Explain fog.

12. Safe and Efficient Operations of an Aircraft

A. Explain fitness for flight.
B. Define hypoxia.
C. Explain dehydration.
D. Explain hyperventilation.
E. Discuss carbon monoxide poisoning.
F. Explain decompression sickness after scuba diving.
G. Identify motion sickness.
H. Explain sinus and ear block.
I. Discuss spatial disorientation
J. Explain illusions in flight
K. Define vision.
L. Explain weight and balance.

13. Principles of Aerodynamics, Powerplants, and Aircraft Systems

A. Explain the four forces of flight (lift, weight, thrust, and drag) and their relationship to each other.
B. Discuss the concept of drag and how it affects aircraft performance, including induced drag and parasite drag.
C. Understand and describe the center of gravity (CG) and how it affects aircraft stability and control.
D. Explain how the aircraft's design influences its control and handling qualities.
E. Identify the role of control surfaces (ailerons, elevators, rudders) in maintaining and changing aircraft attitude.
F. Identify the different types of aircraft engines, including piston, turboprop, and jet engines, and explain their operation.
G. Understand engine performance parameters (e.g., horsepower, torque, fuel efficiency) and their impact on flight operations.
H. Describe the function of major aircraft systems, including electrical, hydraulic, and pneumatic systems.
I. Identify the components and operation of the aircraft's landing gear, brakes, and tires.
J. Discuss how aircraft systems affect emergency procedures (e.g., engine failure, electrical failure, fire).

14. Stalls, Spins, and Recovery

A. Explain the aerodynamics of stall.
B. Define stall/spin recognition.
C. Discuss the cause of spin.
D. Define CG and weight.
E. Identify angle of attack indicators.

15. Aeronautical Decision Making and Judgement

A. Explain Aeronautical Decision Making (ADM).
B. Discuss weather related decision making.
C. Explain stress and flying.
D. Identify hazardous attitudes.

16. Certification and Portfolio

A. Apply knowledge to acquire certification in the FAA Part 107 Remote Pilot Knowledge Test written exam.
B. Explain the TSA application form process.
C. Create a professional digital portfolio reflecting employability skills in the relevant industry to include and "About Me" page.
D. Collect original works (in photographs and videos) and documents that demonstrate technical skills and knowledge in the industry.
E. Demonstrate knowledge of competencies by accompanying each selected document or work with a journal entry or summary.
F. Write a brief resume and cover letter to be included in the portfolio.
G. Develop interviewing techniques using portfolio materials.
H. Display portfolio materials for critique by a professional panel (industry partners and classmates).
I. Gather feedback and update portfolio.

Key Assignments

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
1. In teams, students will create a presentation (PowerPoint, Canva, or Google Slides) of safe work protocols and practices to prevent injury and maintain a clean work area. Students will take a safety test.	1A, B, D, F 2D, E 3A, E 4B, C, F 5A, B, D, H 8A-F, H-J 10A-E 14A	1 2 3 4 7 9 10 11	2 3 4 7 9 10 11		LS 11-12.6 SLS 11-12.2
2. Students will write a 2–3-page essay discussing how historical aviation trends have influenced modern-day aviation (e.g., technology, commercial flight, and military applications). Create a detailed timeline that explains the key events in aviation history from 1939 to the present.	1C 2D 3A 5C, D 6C 7A-E 13A-C 11H 14B 15A, B	1 2 4 5 7 11	2 4 5 7 10	C1.0 C2.0	WS 11-12.6 WS 11-12.7
3. Students will research specific sections of the Federal Aviation Regulations and summarize their application in aviation operations. Present a case study example where these regulations are applied in real flight scenarios. Prepare a presentation explaining the certification procedures for aircraft products, parts, and components. Include a breakdown of the process and required documentation.	1A, D 2D 3A 4C, F 5A-D 6A-C	1 2 4 5 7 8 9 10 11	2 4 5 7 8 9 10	C2.0	WS 11-12.6 WS 11-12.7

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
4. Students will read a recent NTSB report and analyze the findings. Summarize the accident cause(s), and how it might impact aviation safety.	1A-C, F 2A, D-F 3A 8E, H, J 9A-C, E 10C, D 11A-F 12A, B	1 2 4 5 8 9 11 12	2 4 5 8 9 10	C2.0	A-CED 4 RLST 11-12.3 RLST 11-12.4
5. Students will use a sectional chart to plot a route, identify airspace boundaries, and determine distances. Include VFR navigation chart symbology and advisory circulars. Perform a series of calculations using a flight computer (or app), including speed, distance, and time calculations.	1A - F 2A, D 3A, D 4A-C 5C 6A-C 7A-F 9A 10A	1 2 4 5 8 9 11 12	2 4 5 6 8 9 10	C1.0 C2.0 C4.0 C5.0	WS 11-12.6 WS 11-12.7 RSTS 11-12.4 RLST 11-12.3 RLST 11-12.10 SEP 4, 8 CC 2 LS 2.D PS 4.C WS 11-12.4
6. Students will create a chart or map showing different airspaces and detail appropriate radio communication protocols for each. Write a script or role-play a scenario where you communicate with ATC during various phases of a flight (departure, enroute, and arrival).	1A-C, F 2A, D 3A, D 4B-D 7A-F 8E, F, H-J	1 2 4 5 6 11 12	2 4 5 6 9 10	C2.0 C3.0 C4.0 C6.0	LS 11-12.6 WS 11-12.6 WS 11-12.7 RSTS 11-12.4 RLST 11-12.3 RLST 11-12.10 SEP 4, 8 CC 2 ETS 1.B
7. Students will research and write a report on one of the following:	1A - F 2A, D	1 2	2 4	C2.0 C3.0	LS 11-12.6 WS 11-12.6

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
atmospheric pressure, wind systems, cloud formation, or air masses. Include how these affect flight operations. Analyze a weather-related aviation accident and explain how proper weather decision-making could have altered the outcome.	3A, D 4B, C, F 6A-F 8C 9A-F 10A-E 11C, D 14A	4 5 6 11 12	5 6 10	C4.0	WS 11-12.7 RSTS 11-12.4 RLST 11-12.3 RLST 11-12.10 SEP 4, 8 CC 2 ETS 1.B
8. Students will research and write a report on one fitness-for-flight issue (e.g., hypoxia, motion sickness, dehydration). Provide preventive measures and strategies for pilots. Perform a weight and balance calculation for a hypothetical flight, ensuring the aircraft is within safe operating limits.	1A-F 2A, D 3A, D 8C 9A-F 11B-F, I, J 12A-D 14A	1 2 4 5 6 8 11 12	2 4 5 6 8 10	C2.0 C3.0 C4.0	LS 11-12.6 WS 11-12.6 WS 11-12.7 RSTS 11-12.4
9. Students will create a diagram of an aircraft's powerplant system and aerodynamics, explaining how each component works.	1A-F 2A, D 3A 9E 10E 11A, H-J 14A	1 2 4 5 8 10 11	2 4 5 8 10 11	C2.0 C3.0	LS 11-12.6 WS 11-12.6
10. Students will write a report explaining the aerodynamics of a stall and how to recognize and recover from it. Include causes of spin and the effects of CG and weight.	1A-C 2A,D 3A 4D 6F 7A	1 2 4 5 6 8	2 4 5 6 8 10	C2.0 C3.0 C4.0	LS 11-12.6 WS 11-12.6

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
	10C-E 11C, I, J 12A-D 14A	11 12	11		
11. Students will participate in an in-class simulation where you make decisions based on weather, aircraft performance, and situational awareness. Write an essay on one hazardous attitude (e.g., anti-authority, impulsivity) and how it can impact flight safety. Provide strategies to mitigate this attitude.	1A-F 2A, D 3A, D 10C-E 11C, I, J 12A-D 13A	1 2 4 5 8 9 11 12	2 4 5 6 8 9 10 11	C2.0 C3.0 C4.0 C6.0	LS 11-12.6 WS 11-12.6 WS 11-12.7 RSTS 11-12.4 RLST 11-12.3 RLST 11-12.10 SEP 4, 8 CC 2 ETS 1.B
12. Students will participate in mock interviews that represent current industry practices (e.g., skills demonstrations, resumes, applications, portfolios, personal websites, etc.).	1A, D, F 2B, F-H 3A-J 9A-B 12B-D 13C 14A-H 15 A-I	1 2 4 5 8 9 10 11	2 4 5 8 9 10	C1.0 C2.0	LS 11-12.6 WS 11-12.6,7 RLST 11-12.3,4 SEP 4, 8

Standards Assessed in this Program

Career Ready Practices

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

Anchor Standards

2.0 Communications
- Acquire and use accurately sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.

3.0 Career Planning and Management
- Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans.

4.0 Technology
- Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the sector workplace environment.

5.0 Problem Solving and Critical Thinking
- Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.

6.0 Health and Safety
- Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the sector workplace environment.

7.0 Responsibility and Flexibility
- Initiate, and participate in, a range of collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the sector workplace environment and community settings.

8.0 Ethics and Legal Responsibilities

- Practice professional, ethical, and legal behavior, responding thoughtfully to diverse perspectives and resolving contradictions, when possible, consistent with applicable laws, regulations, and organizational norms.

9.0 Leadership and Teamwork

- Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution.

10.0 Technical Knowledge and Skills

- Apply essential technical knowledge and skills common to all pathways in the sector following procedures when carrying out experiments or performing technical tasks.

11.0 Demonstration and Application

- Demonstrate and apply the knowledge and skills contained in the Transportation anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through the SkillsUSA career technical student organization.

Pathway Standards

Transportation - Systems Diagnostics and Service Pathway

C1.0 Demonstrate the practice of personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.
C2.0 Practice the safe and appropriate use of tools, equipment, and work processes.
C3.0 Use scientific principles in relation to chemical, mechanical, and physical functions for various engine and vehicle systems.
C4.0 Perform and document maintenance procedures in accordance with the recommendations of the manufacturer.
C5.0 Apply and understand appropriate business practices.
C6.0 Demonstrate the application, operation, maintenance, and diagnosis of engines
C7.0 Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.

Common Core State Standards

ENGLISH LANGUAGE ARTS

Language Standards

LS 11-12.6: Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the (career and college) readiness level, demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
LS 2.D

Reading Standards for Literacy in Science and Technical Subjects

RLST 11-12.3: Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
RLST 11-12.4: Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or

technical context.
RLST 11-12.10: By the end of grade 12 read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.

Speaking and Listening Standards
SLS 11-12.2: Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions, and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.
SLS 11-12.1: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
SLS 11-12.1d: Respond thoughtfully to diverse perspectives, synthesize comments, claims and evidence made on all sides of an issue, resolve contradictions when possible, and determine what additional information or research is required to deepen the investigation or complete the work.

Writing Standards
WS 11-12.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
WS 11-12.6: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback including new arguments and information.
WS 11-12.7: Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem, narrow or broaden the inquiry when appropriate, synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

MATHEMATICS

Algebra- Creating Equations
A-CED 4: Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.

SCIENCE

Crosscutting Concept
CC 2: Cause and effect: Mechanism and explanation

Engineering, Technology, and the Applications of Science
ETS 1.B: Developing Possible Solutions

Physical Sciences
PS 3.A: Definitions of Energy
PS 3.B: Conservation of Energy and Energy Transfer
PS 4.C: Information Technologies and Instrumentation

Scientific and Engineering Practices

SEP 4: Analyzing and interpreting data

SEP 8: Obtaining. evaluating, and communicating information