Avionics for Pilots

Level: 4
Career Cluster: Advanced Manufacturing
Program: Engineering
Pathway(s): Engineering Applications UAS

Course Catalog Description

Avionics for Pilots introduces students to aviation and drone systems. Students learn navigation, communication, weather, and safety for flight operations.

Summary

Prepares students to understand and apply the systems, tools, and decision-making processes used in aviation and uncrewed aircraft systems. Through the study of career pathways, human factors, flight instruments, sensor systems, attitude control, navigation, airspace, communication procedures, charts, weather, and emergency planning, students develop the knowledge needed to interpret avionics information and support safe, efficient flight operations. The course emphasizes technical analysis, operational planning, regulatory awareness, and the use of aviation and drone terminology as students evaluate mission conditions, design flight plans, and complete an applied drone avionics mission project that integrates safety, navigation, and real-world problem solving.

Notes

This revised course broadens the scope to better support a modern secondary CTE pathway in aviation and UAS applications. The earlier version centered on stage-based instrument ground school content and concurrent-enrollment alignment, while the new version reframes the learning into clearly articulated student outcomes that connect avionics concepts to both crewed aviation and drone operations. This updated structure increases accessibility for high school learners by emphasizing interpretation, application, safety, and career relevance rather than exam-prep sequencing alone, and it more intentionally embeds employability, leadership, work-based learning, and applied project-based experiences throughout the course. Major updates include the addition of expanded content on human factors, aviation physiology, UAS sensor systems, digital flight planning tools, drone-specific navigation and airspace analysis, weather interpretation for remote operations, contingency planning, and an applied drone avionics mission project that synthesizes technical and operational skills. The revised document also introduces more explicit connections to industry and postsecondary pathways, Colorado CTE expectations, academic standards alignment, and free instructional resources organized by section. New student outcome areas for leadership and work-based learning strengthen the course's focus on professionalism, collaboration, career readiness, and authentic industry engagement. Overall, the course has been modernized from a narrowly focused instrument ground school outline into a more comprehensive avionics and UAS course that supports technical knowledge, real-world application, and broader pathway relevance for today's students.

Student Learning Outcomes

1. Career Exploration and Postsecondary Opportunities

Objective: *Students will analyze career pathways in engineering and drones by exploring industry roles, workplace expectations, required education, certifications, professional organizations, and postsecondary opportunities available in Colorado in order to make informed academic and career decisions.*

1) Identify employment opportunities in various fields with a focus in the area of engineering and drones
    a. Recognize the work typically performed, tools and technology used, and nature of work environments
    b. Identify potential certifications within the careers
    c. Find membership organizations associated with the careers
    d. Understand the necessary education associated within the careers
2) Define professionalism within the context of engineering and drones
    a. Criticism and evaluation
    b. Presentation
    c. Assessment
3) Recognize laws, regulations, and ethics significant to the fields of engineering and drones
4) Identify postsecondary opportunities offered in the state of Colorado
    a. Technical college, community college, 4-year institutions
    b. Certificates, associates, bachelor, and advanced degree opportunities

2. Human Factors, Aviation Physiology, and Safe UAS Operations

Objective: *Students will explain how human factors and physiology affect pilot performance, situational awareness, and safe drone operations.*

5) Define human factors and aviation physiology in the context of flight operations
6) Explain how fatigue, stress, distraction, and workload can affect decision-making in both piloted and remotely operated systems
7) Describe how vision, spatial orientation, and cognitive processing influence flight safety
8) Analyze the relationship between human limitations and the design of avionics displays and warning systems
9) Evaluate safety risks associated with operating drones beyond visual line of sight, in complex environments, or under changing conditions
10) Recommend strategies to reduce human error during preflight, inflight, and postflight operations

3. Flight Instruments and UAS Sensor Systems

Objective: *Students will interpret the purpose and function of flight instruments and relate them to the sensor systems used in drone platforms.*

11) Identify common flight instruments used in aviation systems
12) Explain how flight instruments provide information about altitude, attitude, direction, speed, and system status

13) Compare traditional aircraft instruments to drone telemetry, sensor readouts, and digital interfaces
14) Analyze how onboard sensors support stabilization, positioning, navigation, and mission awareness in UAS operations
15) Interpret basic flight and telemetry data from a classroom drone platform
16) Evaluate the importance of instrument accuracy, calibration, and system reliability in flight decision-making
17) Differentiate among GPS, inertial sensors, barometric sensors, cameras, and obstacle-detection systems in drone applications

4. Attitude Control, Stability, and Flight by Reference to Instruments

Objective: *Students will apply knowledge of flight attitude, control, and instrument reference to safe aircraft and drone operations.*

18) Describe the relationship between attitude, control inputs, and aircraft or drone response
19) Explain how operators maintain orientation and control using instrument data and display systems
20) Analyze situations in which instrument reference is necessary for safe navigation or recovery
21) Compare manual observation-based flight with instrument-guided and telemetry-supported flight
22) Demonstrate how drones use sensors and control systems to maintain stable flight
23) Evaluate how delayed, inaccurate, or conflicting instrument inputs can affect system safety
24) Apply attitude and stability concepts to drone mission examples such as hovering, turning, climbing, descending, and automated route following

5. Navigation Systems and Mission Routing

Objective: *Students will analyze navigation systems and apply routing concepts to both aviation and drone mission planning.*

25) Identify major aviation navigation concepts and systems
26) Explain how location, heading, route, and position are determined in flight operations
27) Compare traditional navigation aids with GPS and satellite-based navigation used in drone systems
28) Interpret navigation information from maps, flight displays, or mission-planning software
29) Analyze how GPS, RNAV, and waypoint-based systems support drone missions
30) Develop a basic route or waypoint plan for a drone mission based on mission goals and constraints
31) Evaluate the strengths and limitations of automated navigation tools in aviation and UAS operations

6. Airports, Airspace, and Operational Environments

Objective: *Students will interpret airport and airspace systems and apply this knowledge to safe drone mission planning and legal operation.*

32) Identify major airport features, operational zones, and aviation infrastructure
33) Explain the purpose of controlled and uncontrolled airspace

34) Compare airspace considerations for crewed aircraft and drone operations
35) Interpret airspace restrictions, airport environments, and local operating limitations
36) Analyze how airspace affects drone mission approvals, route design, and communication requirements
37) Apply knowledge of location, altitude limits, and proximity to airports when evaluating a UAS mission
38) Evaluate risks associated with operating drones near airports, populated areas, or restricted zones
39) Recommend compliant operational decisions for drone flights conducted in different airspace environments

7. Air Traffic Communication, Clearances, and Operational Procedures

Objective: *Students will explain communication procedures and evaluate how coordination supports safe aviation and drone operations.*

40) Describe the role of air traffic control in the aviation system
41) Explain the function of clearances, communications, and procedural coordination in flight operations
42) Summarize standard communication practices used in aviation environments
43) Compare crewed-aircraft communication procedures with drone operational coordination requirements
44) Interpret how operational instructions and procedural information affect mission planning and execution
45) Evaluate the importance of concise, accurate communication for safety and efficiency
46) Apply communication concepts to drone operations, including mission briefings, team coordination, and incident reporting

8. Charts, Procedures, and Digital Flight Planning Tools

Objective: *Students will interpret aviation charts and procedural information and use digital tools to support planning for drone missions and instrument-based operations.*

47) Identify the purpose of departure, arrival, en-route, and approach charts
48) Explain how charts organize information related to navigation, terrain, facilities, and procedures
49) Analyze the role of charted procedures in safe and efficient operations
50) Compare aviation chart use with drone mission-planning maps and geofencing tools
51) Interpret digital planning tools used to evaluate routes, altitude, hazards, and operating constraints
52) Construct a simple drone flight plan using map-based or waypoint-based planning methods
53) Evaluate chart and map information for possible hazards, route conflicts, and operational limitations

9. Weather, Hazards, and Sources of Flight Information

Objective: *Students will evaluate weather information and apply hazard awareness to drone and aviation decision-making.*

54) Identify major weather hazards that affect aircraft and drone operations
55) Explain how weather can influence visibility, control, navigation, battery performance, and mission success
56) Interpret printed and graphical weather products used in flight planning
57) Compare sources of weather information used by pilots and drone operators
58) Analyze how wind, precipitation, ceilings, visibility, turbulence, and temperature affect mission safety
59) Evaluate a weather scenario and determine whether conditions are appropriate for a planned drone mission
60) Recommend operational adjustments based on changing or forecast weather conditions

10. Instrument Procedures, Emergencies, and Contingency Planning

Objective: *Students will analyze instrument procedures and develop response strategies for abnormal conditions and emergency situations in flight operations.*

61) Describe the purpose of standardized instrument procedures in aviation
62) Explain how emergency procedures support safe decision-making during abnormal events
63) Analyze operational scenarios involving equipment failure, signal loss, navigation disruption, or degraded environmental conditions
64) Compare emergency procedures in crewed aviation with contingency planning for drone missions
65) Develop a response plan for common UAS issues such as lost link, GPS interruption, battery warnings, or return-to-home events
66) Evaluate how procedural discipline reduces risk during emergency situations
67) Justify selected emergency responses using safety, mission, and environmental factors

11. Applied Drone Avionics Mission Project

Objective: *Students will design and present a drone mission plan that integrates avionics, navigation, weather, airspace, and safety considerations.*

68) Define a mission goal, criteria, and operating constraints for a drone-related task
69) Select appropriate avionics and navigation tools for the mission scenario
70) Interpret weather, airspace, and site information to support safe planning
71) Develop a mission route, operating plan, and contingency procedures
72) Apply human factors and safety principles during mission preparation
73) Present the completed mission plan using aviation and drone terminology
74) Evaluate the effectiveness of the mission plan and propose improvements based on risk, efficiency, and technical performance

12. Leadership

Objective: *Students will demonstrate leadership skills that support safe, ethical, and effective participation in aviation and UAS learning environments, team projects, and career development experiences.*

75) Demonstrate responsibility, dependability, and initiative when completing aviation and drone-related tasks

76) Apply effective communication, active listening, and collaboration strategies during team-based flight planning and problem-solving activities
77) Demonstrate ethical decision-making and accountability when addressing safety, compliance, and operational concerns
78) Set personal and team goals, monitor progress, and adjust strategies to improve performance and project outcomes
79) Demonstrate leadership through participation in classroom, CTSO, or project-based activities that build professionalism and service

13. Work-Based Learning

Objective: *Students will connect classroom learning to real-world aviation and UAS applications through work-based learning experiences, career preparation activities, and reflection on workplace expectations.*

80) Identify how classroom knowledge and technical skills apply to aviation, aerospace, and drone industry work settings
81) Demonstrate appropriate workplace behaviors, including punctuality, communication, professionalism, and attention to safety
82) Engage in a work-based learning experience such as an industry-sponsored project, job shadow, guest expert interaction, simulation, or internship-related activity
83) Document tasks, skills developed, and feedback received during work-based learning experiences
84) Reflect on career interests, workplace expectations, and next steps for continued education, training, or employment in aviation and UAS fields

14. Career and Technical Student Organizations

Objective: *Using the CTSO Resource Document, chapter activities will provide some of the best opportunities CTSO members will have to learn by doing. A successful program of work creates a positive learning atmosphere in the classroom. CTSO members learn how to accept responsibility, work as a team, manage a budget, and handle success and failure. Per the CTE Admin Handbook, CTSOs are embedded into curriculum.*

Professional Development

Prepare each member for entry into the workforce and provide a foundation for success in a career. Becoming a professional does not stop with acquiring a skill, but involves an increased awareness of the meaning of good citizenship and the importance of labor and management in the world of work.

Community Service

Promote and improve goodwill and understanding among all segments of the community through services donated by CTSO chapters, and to instill in its members a lifetime commitment to community service.

Business and Industry Connections

Increase awareness of quality job practices and attitudes, and increase the opportunities for employer engagement and eventual employment.

Financial Leadership

Plan and participate in activities to allow all members to carry out the chapter's projects. Educate members on their own personal finance for current and future success.

Public Relations

Make the general public aware of the good work that students in career and technical education are doing to better themselves and their community, state, nation, and world.

Social Activities

To increase cooperation in the school and community through activities that allow CTSO members to get to know each other in something other than a business or classroom setting.

Academic Standards Alignment

Colorado CTE courses are required to integrate academic and essential skills into course content. The following academic standards have been identified as aligned to this course and should be integrated throughout instruction.

CO CTE Academic Standards Resources (Rubrics, integration strategies, etc)
CDE Colorado Academic Standards Online (Online standards lookup tool)

Note: Mathematics and Science standards will be added in the future. Visit the Colorado Academic Standards page for the most current version.

Reading, Writing and Communicating Crosswalk

Course: Avionics for Pilots
Colorado Academic Standards – Reading, Writing, and Communicating

Standard	Prepared Graduate Competency	Description	Course Evidence / Alignment
Standard 1: Oral Expression and Listening	Prepared Graduate 1 – Collaboration	Collaborate effectively as group members or leaders.	Collaborative avionics problem-solving and scenario-based flight activities; group discussion of system behavior, troubleshooting, and safety considerations; incorporates peer/instructor feedback on avionics-related decisions.
Standard 1: Oral Expression and Listening	Prepared Graduate 2 – Oral Presentations	Deliver effective oral presentations for varied audiences and varied purposes.	Students verbally explain avionics systems, displays, and functions; describe navigation/communication/instrument data to support flight decisions; communicate procedures and abnormal conditions using aviation-appropriate language.
Standard 2: Reading for All Purposes	Prepared Graduate 4 – Informational Texts	Read a wide range of informational texts to build knowledge.	Reading and interpreting avionics manuals, technical guides, and system documentation; FAA regulations and flight information related to instruments/avionics; charts, procedures, and electronic flight display information.
Standard 2: Reading for All Purposes	Prepared Graduate 5 – Language in Context	Understand how language functions in different contexts.	Requires precise use of aviation and avionics terminology; decoding abbreviations, symbols, and coded system information; emphasizes context-dependent language where

			accuracy and clarity are safety-critical.
Standard 3: Writing and Composition	Prepared Graduate 6 – Craft arguments	Craft arguments using techniques specific to the genre.	Students justify avionics-related decisions (navigation choices, instrument reliance, troubleshooting actions); defend operational choices using system data, regulations, and safety criteria; support conclusions with technical evidence.
Standard 3: Writing and Composition	Prepared Graduate 7 – Informational Writing	Craft informational/explanatory texts using techniques specific to the genre.	Produces explanations of avionics system operation; written descriptions of procedures and system behavior; technical documentation aligned with aviation and flight standards.
Standard 3: Writing and Composition	Prepared Graduate 9 – Writing Process	Demonstrate mastery of their own writing process.	Drafts, revises, and finalizes avionics-related explanations and reports; produces clear, accurate, professional technical writing; applies correct aviation conventions and terminology in final products.
Standard 4: Research Inquiry and Design	Prepared Graduate 10 – Research and Ethics	Gather information from a variety of sources; analyze and evaluate its quality and relevance.	Researches avionics technologies, FAA guidance, and system capabilities; analyzes multiple sources to inform safe flight decisions; uses information ethically to support operational judgment and compliance.

Free Resource Links

1. Career Exploration and Postsecondary Opportunities

- Bureau of Labor Statistics Aviation Careers (aviation careers avionics jobs education pathways)
  https://www.bls.gov/ooh
- FAA Aviation Careers (pilot avionics technician certifications training pathways)
  https://www.faa.gov/jobs
- CareerOneStop Aerospace Careers (career exploration aviation engineering pathways)
  https://www.careeronestop.org
- NASA STEM Careers (STEM aviation engineering workforce skills future careers)
  https://www.nasa.gov/stem

2. Human Factors Aviation Physiology and Safe UAS Operations

- FAA Human Factors Guide (human factors fatigue stress situational awareness aviation safety)
  https://www.faa.gov
- SKYbrary Human Factors Resource (human performance decision making aviation safety)
  https://www.skybrary.aero
- NASA Human Integration Design Handbook (human systems aviation physiology performance limits)
  https://www.nasa.gov
- CAA Human Factors Safety (human error risk management aviation operations)
  https://www.caa.co.uk

3. Flight Instruments and UAS Sensor Systems

- FAA Aviation Instruments Handbook (flight instruments altitude navigation systems)
  https://www.faa.gov
- NASA Flight Instrument Basics (flight instruments control navigation systems understanding)
  https://www.grc.nasa.gov
- DJI Sensors Overview (drone sensors GPS vision systems stabilization)
  https://enterprise.dji.com
- Garmin Avionics Systems (avionics displays navigation systems cockpit technology)
  https://www.garmin.com

4. Attitude Control Stability and Flight by Reference to Instruments

- FAA Attitude Instrument Flying Guide (attitude control instrument flying stability)
  https://www.faa.gov
- NASA Aircraft Control Systems (pitch roll yaw control systems aerodynamics)
  https://www.grc.nasa.gov
- Skybrary Flight Control Systems (flight control stability aircraft systems)
  https://www.skybrary.aero

- Drone Flight Stability DJI Guide (drone stabilization sensors control systems) https://enterprise.dji.com

5. Navigation Systems and Mission Routing

- GPS Basics Government Resource (GPS navigation satellite positioning systems) https://www.gps.gov
- FAA Navigation Systems Overview (navigation aids RNAV GPS systems aviation) https://www.faa.gov
- SkyVector Flight Planning Tool (flight planning navigation maps aviation routing) https://skyvector.com
- DJI Waypoint Flight Guide (waypoint navigation drone mission planning) https://www.dji.com

6. Airports Airspace and Operational Environments

- FAA Airspace Basics (airspace classifications aviation rules operations) https://www.faa.gov
- SKYbrary Airspace Guide (controlled uncontrolled airspace aviation safety) https://www.skybrary.aero
- FAA UAS Airspace Rules (drone airspace restrictions operations compliance) https://www.faa.gov/uas
- B4UFLY Drone Airspace Tool (drone airspace awareness flight authorization) https://www.b4ufly.aloft.ai

7. Air Traffic Communication Clearances and Operational Procedures

- FAA Pilot ATC Communications (air traffic control communication procedures) https://www.faa.gov
- SKYbrary ATC Procedures (air traffic control coordination communication systems) https://www.skybrary.aero
- LiveATC Radio Examples (ATC communication listening training procedures) https://www.liveatc.net
- FAA Pilot Controller Glossary (aviation communication terminology procedures) https://www.faa.gov

8. Charts Procedures and Digital Flight Planning Tools

- FAA Aeronautical Charts Guide (charts navigation symbols procedures aviation) https://www.faa.gov
- SkyVector Aviation Charts (digital charts flight planning maps navigation) https://skyvector.com
- ForeFlight Learning Center (digital flight planning tools avionics navigation) https://foreflight.com
- FAA Chart User Guide (chart symbols procedures navigation understanding) https://www.faa.gov

9. Weather Hazards and Sources of Flight Information

- Aviation Weather Center (weather reports METAR TAF aviation forecasting)
  https://aviationweather.gov
- NOAA Weather Service Aviation (weather hazards forecasts aviation data)
  https://www.weather.gov
- FAA Weather Handbook (weather interpretation flight safety conditions)
  https://www.faa.gov
- METAR Decoder Tool (weather report decoding aviation weather data)
  https://metar-taf.com

10. Instrument Procedures Emergencies and Contingency Planning

- FAA Instrument Procedures Guide (instrument approaches procedures navigation systems)
  https://www.faa.gov
- SKYbrary Emergency Procedures (aviation emergencies response decision making)
  https://www.skybrary.aero
- FAA Risk Management Handbook (risk assessment decision making aviation safety)
  https://www.faa.gov
- NASA Aviation Safety Reporting System (incident analysis safety lessons aviation)
  https://asrs.arc.nasa.gov

11. Applied Drone Avionics Mission Project

- DJI Education Resources (drone mission planning avionics systems applications)
  https://edu.dji.com
- DroneBlocks Coding and Missions (drone missions waypoint planning coding systems)
  https://droneblocks.io
- NASA Engineering Design Process (engineering design project planning problem solving)
  https://www.nasa.gov/stem
- Esri Drone Mapping Projects (drone mapping missions GIS data analysis projects)
  https://www.esri.com

12. Leadership

- National Clearinghouse for Leadership Programs (leadership development student leadership frameworks resources)
  https://nclp.umd.edu/
- University of Washington Student Leadership Competencies (leadership competencies reflection community engagement teamwork)
  https://cele.uw.edu/site/assets/files/1211/guide_to_building_student_leadership_competencies_for_community_based_engagement.pdf
- University of Oregon Career Preparation Toolkit (leadership professionalism teamwork career competencies)
  https://teaching.uoregon.edu/career-preparation-toolkit

- NACE Career Readiness Competencies (leadership professionalism teamwork communication employability skills)
  https://www.naceweb.org/career-readiness/competencies/career-readiness-defined/

13. Work-Based Learning

- CTE Learn High-Quality CTE: Work-Based Learning (job shadow internship apprenticeship work-based learning continuum)
  https://www.ctelearn.org/certified-courses/course/HQ111/high-quality-cte:-work-based-learning
- SkillsUSA Students Work-Based Learning (workplace learning business partnerships career readiness experiences)
  https://www.skillsusa.org/students/
- CTE Learn Student Career Development (career readiness real-world experience work-based learning)
  https://www.ctelearn.org/cte-lessons/student-career-development
- CareerOneStop Outreach Materials (career exploration job search workplace preparation student resources)
  https://www.careeronestop.org/Outreach/outreach-materials.aspx

Technology Student Association – National Competitive Events

Geospatial Technology

Objective: *Students will collect, analyze, map, synthesize, and defend geospatial data in response to the annual TSA Geospatial Technology challenge.*

- Research the annual TSA Geospatial Technology challenge and identify the geographic issue or prediction being investigated.
- Collect geospatial data such as imagery, boundaries, transportation data, earth observations, historical maps, or basemaps.
- Use an online mapping platform to represent and analyze geospatial data.
- Prepare a digital documentation portfolio explaining the challenge, collected data, analysis maps, prediction, resources, and work log.
- Create a visual infographic map that communicates the predicted outcome and clearly supports it with data.
- Present and defend the team's prediction during the semifinal presentation/interview.
- Evaluate the final entry using TSA criteria for data use, prediction quality, visual communication, analysis, creativity, and presentation.

Resources

- Technology Student Association – Geospatial Technology competition guidelines https://tsaweb.org/competitions-programs/tsa/themes-problems
- ArcGIS Online – Mapping and geospatial analysis tools https://www.arcgis.com/
- FAA – Aeronautical Charts and Chart Users' Guide https://www.faa.gov/airtraffic/flightinfo/aeronav/digitalproducts/aeroguide/
- NASA Earthdata – Earth observation and geospatial data https://www.earthdata.nasa.gov/

Technology Student Association – National Competitive Events

Data Science and Analytics

Objective: *Students will collect, analyze, visualize, document, and present a data set connected to the annual TSA Data Science and Analytics theme.*

- Research the annual TSA Data Science and Analytics theme and identify a focused topic for investigation.
- Collect or compile a data set of at least 500 rows from credible and relevant sources.
- Analyze data to identify trends, patterns, relationships, limitations, and possible predictions.
- Create a digital scientific poster that communicates the research question, data source, visualizations, analysis, and findings.
- Prepare a documentation portfolio explaining methods, data collection, analysis, conclusions, and resources.
- Present the digital scientific poster within the TSA time limit using clear, evidence-based communication.
- Complete an on-site semifinal challenge by creating a visual representation and brief synopsis from a provided data set.

Resources

- Technology Student Association – Data Science and Analytics competition guidelines https://tsaweb.org/competitions-programs/tsa/themes-problems
- NOAA Aviation Weather Center https://aviationweather.gov/
- FAA – Aviation Weather Handbook https://www.faa.gov/regulationspolicies/handbooksmanuals/aviation
- Tableau Public – Data visualization tools https://public.tableau.com/

Technology Student Association – National Competitive Events

Technology Bowl

Objective: *Students will build broad knowledge of TSA, STEM concepts, technology standards, and engineering-related content to compete in the TSA Technology Bowl written test and team question/response format.*

- Study TSA history, competitive events, leadership concepts, and technology-content standards.
- Build foundational knowledge across science, technology, engineering, mathematics, and applied technology topics.
- Work as a three-person team to prepare for individual testing and team-based competition.
- Complete practice questions that require accuracy, recall, reasoning, and quick decision-making.
- Analyze missed questions to identify gaps in technology, engineering, and TSA knowledge.
- Practice head-to-head question/response procedures for semifinal-style competition.
- Evaluate team performance using accuracy, collaboration, preparation, and communication criteria.

Resources

- Technology Student Association – Technology Bowl competition guidelines https://tsaweb.org/competitions-programs/tsa/themes-problems
- Technology Student Association – About TSA https://tsaweb.org/about
- FAA – Pilot's Handbook of Aeronautical Knowledge https://www.faa.gov/regulationspolicies/handbooksmanuals/aviation/phak
- FAA – Instrument Flying Handbook https://www.faa.gov/regulationspolicies/handbooksmanuals/aviation