

Aviation

Course Code: 20053

Rational Statement:

Aviation courses provide students with an understanding of the science of flight and typically include the history, regulations, and possible career paths within the aviation industry. Aviation courses usually cover physics, the relationships of weight and balance, principles of navigation and flight control, ground and airport operations and services, and Federal Aviation Agency regulations.

Suggested Grade Level: 10-12

Topics Covered:

- History of Flight
- Principles of Flight
- Flight Environment
- Aircraft Systems and Performance
- Weather
- Navigation (Basic and Radio)
- Aviation Physiology
- Aerospace
- Career Possibilities

Core Technical Standards & Examples

Indicator 1: Identify events in the history of flight	
Bloom's Taxonomy Level	Standard and Example
Analyzing	AV1.1 Identify flight in the ancient world Examples: <ul style="list-style-type: none">• Identify the history of flight in Greek Myths• Identify the importance of Kites and Balloons in China during the third century.
Analyzing	AV1.2 Identify the development of flight in the early 1900s Examples: <ul style="list-style-type: none">• Distinguish the difference between lighter-than-air and heavier-than-air.• Identify the importance of blimps.

	<ul style="list-style-type: none"> Identify the importance of the Wright brothers
Analyzing	<p>AV1.3 Identify the development of flight during the Golden Age of Flight (1918 to 1939)</p> <p>Examples:</p> <ul style="list-style-type: none"> Identify the importance of Charles Lindbergh. Identify the importance of the Airmail Act (Kelly Act of 1925)
Analyzing	<p>AV1.4 Identify the development of flight innovation during World War II. (1939 to 1945)</p> <p>Examples:</p> <ul style="list-style-type: none"> Identify the importance of the V-2 rocket Identify the importance of early jets
Analyzing	<p>AV1.5 Identify the development of flight innovation during the Cold War (1945 to 1991)</p> <p>Examples:</p> <ul style="list-style-type: none"> Identify the importance of commercial aviation Identify the importance of space flight
Analyzing	<p>AV1.6 Identify the development of flight innovation (1991 to present)</p> <p>Examples:</p> <ul style="list-style-type: none"> Identify the importance of subsonic military aviation Identify the importance of unmanned aircraft
Indicator 2: Investigate the principles of flight	
Bloom's Taxonomy Level	Standard and Example
Evaluating	<p>AV2.1 Investigate the basic parts and control surfaces</p> <p>Examples:</p> <ul style="list-style-type: none"> Examine the utilization of the airfoil Examine the utilization of the wings Examine the utilization of the tail Examine the utilization of the propeller
Analyzing	<p>AV2.2 Investigate the four forces of flight</p> <p>Examples:</p> <ul style="list-style-type: none"> Explore the concept of lift versus weight Explore the concept of thrust versus drag
Evaluating	AV2.3 Investigate basic aerodynamics.

	<p>Examples:</p> <ul style="list-style-type: none"> • Explore the concept of Newton’s Three Laws of Motion • Explore the concept of Bernoulli effect • Explore the concept of Venturi effect • Explore the concept of Static versus Dynamic Pressure
Evaluating	<p>AV2.4 Investigate airplane stability</p> <p>Examples:</p> <ul style="list-style-type: none"> • Explore the concept of Pitch • Explore the concept of Roll • Explore the concept of Yaw
Indicator 3: Understand the flight environment	
Bloom’s Taxonomy Level	Standard and Example
Understanding	<p>AV3.1 Comprehend air safety</p> <p>Examples:</p> <ul style="list-style-type: none"> • List the types of air safety concerns • Demonstrate an understanding of the Federal Aeronautics Administration (FAA) regulations
Understanding	<p>AV3.2 Comprehend the airport layout</p> <p>Examples:</p> <ul style="list-style-type: none"> • List the types of airports • List the types of runway accidents
Understanding	<p>AV3.3 Comprehend airspace control</p> <p>Examples:</p> <ul style="list-style-type: none"> • Complete a flight plan • Comprehend air-traffic control procedures
Understanding	<p>AV3.4 Comprehend radio communications</p> <p>Examples:</p> <ul style="list-style-type: none"> • Comprehend the language of radio communication in the air • Comprehend how two-way radios work
Indicator 4: Understand aircraft systems and performance	
Bloom’s Taxonomy Level	Standard and Example

Understanding	<p>AV4.1 Know the basic aircraft instruments</p> <p>Examples:</p> <ul style="list-style-type: none"> Identify the six basic aircraft instruments (airspeed indicator, attitude indicator, altimeter, turn coordinator, heading indicator, and vertical speed indicator) Interpret the reading of each instrument to confirm an accurate ‘instrument scan’
Understanding	<p>AV4.2 Know aircraft systems.</p> <p>Examples:</p> <ul style="list-style-type: none"> List the basic flight control systems (mechanical, hydro mechanical and fly-by-wire) Describe the latest innovations in fly-by-wire flight control systems (Fly-by-optics, power-by-wire, and intelligent flight control systems)
Applying	<p>AV4.3 Predict aircraft performance</p> <p>Examples:</p> <ul style="list-style-type: none"> Solve percentage problems Solve ratio and proportion problems to include compression ratio of an aircraft engine
Applying	<p>AV4.4 Calculate weight and balance</p> <p>Examples:</p> <ul style="list-style-type: none"> Compute empty weight center of gravity on an aircraft Compute loaded weight and loaded weight center of gravity of an aircraft
Indicator 5: Understand weather and flight	
Bloom’s Taxonomy Level	Standard and Example
Synthesizing	<p>AV5.1 Explain basic weather theory</p> <p>Examples:</p> <ul style="list-style-type: none"> Explain the composition of the Earth’s atmosphere Explain how temperature variation influences flight performance
Evaluating	<p>AV5.2 Describe weather patterns and clouds</p> <p>Examples:</p> <ul style="list-style-type: none"> Analyze pressure systems at different attitudes on a surface

	<p>map</p> <ul style="list-style-type: none"> Identify the types of clouds (stratus, cumulonimbus, and cirrus) at different elevations and the potential hazards that may exist
Evaluating	<p>AV5.3 Explain weather hazards</p> <p>Examples:</p> <ul style="list-style-type: none"> Compare and contrast the common weather hazards when flying Identify safe and corrective actions for common weather hazards as suggested by the Federal Aeronautics Administration (FAA)
Evaluating	<p>AV5.4 Interpret weather data</p> <p>Examples:</p> <ul style="list-style-type: none"> Interpret current weather condition using a weather map Collect and analyze local weather data
Understanding	<p>AV5.5 Identify sources of weather information</p> <p>Examples:</p> <ul style="list-style-type: none"> Understand SIGMET (Significant Meteorological Information) service Define the role of the ADDS (Aviation Data Service)
Indicator 6: Understand navigation in aviation	
Bloom's Taxonomy Level	Standard and Example
Understanding	<p>AV6.1. Understand Basic Navigation</p> <p>Examples:</p> <ul style="list-style-type: none"> List and describe the essential information a pilot needs to know. (Starting point, Ending point, Direction, Distance, Speed, Fuel Capacity, and Weight and Balance) List the advantages and disadvantages of VFR (Visual Flight Rules) flying
Understanding	<p>AV6.2 Understand Dead Reckoning</p> <p>Examples:</p> <ul style="list-style-type: none"> Define Dead Reckoning Calculate a flight course using the elements of course line, airspeed, course heading and elapsed time
Applying	AV6.3 Utilize a Flight Computer

	<p>Examples:</p> <ul style="list-style-type: none"> • Understand the basic concepts of a flight computer • Use a flight computer to file a flight plan
Understanding	<p>AV6.4 Understand Aeronautical Charts</p> <p>Examples:</p> <ul style="list-style-type: none"> • Plot a course using an Aeronautical Chart • Evaluate flight plans for improved efficiency
Understanding	<p>AV6.5 Comprehend Radio Navigation</p> <p>Examples:</p> <ul style="list-style-type: none"> • Distinguish between the types of Radio Navigation (Automatic Direction Finder (ADF), Very High Frequency Omni-directional Range (VOR), Distance Measuring Equipment (DME), Instrument Landing System (ILS) and LORAN-C) • Explain the types of Radio Navigation
<p>Indicator 7: Understand aviation physiology</p>	
Bloom's Taxonomy Level	Standard and Example
Understanding	<p>AV7.1 Know the effect on the body in the flight environment</p> <p>Examples:</p> <ul style="list-style-type: none"> • Identify the potential hazards on the body during flight. • List and describe the safety procedures to prevent aviation accidents
<p>Indicator 8: Understand aerospace science and technology</p>	
Bloom's Taxonomy Level	Standard and Example
Understanding	<p>AV8.1 Know the nature and characteristics of space</p> <p>Examples:</p> <ul style="list-style-type: none"> • Understand the origin and evolution of the earth system • Understand key terms used in space science
Understanding	<p>AV8.2 Comprehend our Understanding of the universe</p> <p>Examples:</p> <ul style="list-style-type: none"> • Understand the origin and evolution of the universe. • Summarize key innovations that will contribute to our Understanding of the Universe.

Understanding	<p>AV8.3 Understand basic rocket theory and space flight</p> <p>Examples:</p> <ul style="list-style-type: none"> • Know the history of rocketry. • Comprehend the development of space flight.
Analyzing	<p>AV8.4 Analyze the Space Shuttle program</p> <p>Examples:</p> <ul style="list-style-type: none"> • Understand the significance of the Space Shuttle. • Analyze the contributions made by the Space Shuttle program.
Analyzing	<p>AV8.5 Analyze the International Space Station</p> <p>Examples:</p> <ul style="list-style-type: none"> • List the stages of development with the International Space Station. • Analyze the impact the space station will have on future space travel.
Understanding	<p>AV8.6 Comprehend the Hubble Space Telescope</p> <p>Examples:</p> <ul style="list-style-type: none"> • Summarize the development of the Hubble Space Telescope • Predict the future of the Hubble Space Telescope program
Indicator 9: Explore the multiple careers in aviation	
Bloom's Taxonomy Level	Standard and Example
Understanding	<p>AV9.1 Summarize aviation career fields and occupations</p> <p>Examples:</p> <ul style="list-style-type: none"> • Research career opportunities that best meet their interests by participating in career exploration activities • Interview a professional working in an occupation that is of interest to them • Explore the requirements, skills, wages, education, and geographic opportunities in one career of each pathway (audio and video technology and film, printing technology, visual arts, performing arts, journalism and broadcasting, and telecommunications) in this career cluster