

Introduction to Aerospace and Aviation

PEIMS Code: N1304672

Abbreviation: INTAEAVI

Grade Level(s): 9–11

Award of Credit: 1.0

Approved for use beginning 8/1/2019-2020

- (B) summarize how inventors used gliders and balloons to further their knowledge of flight;
 - (C) explain how engineering practices can be applied to Davinci's earliest flying inventions and to recent aircraft models;
 - (D) describe the scientific method the Wright brothers used to solve the power, control, and lift problems they encountered;
 - (E) differentiate between early and more modern airfoil designs of wings and propeller blades and identify the strengths and weaknesses in each; and
 - (F) identify aviation manufacturing pioneers such as Glen Curtis, Bill Boeing, Clyde Cessna, Lloyd Stearman, Walter Beech, and Olive Ann Mellor and their contributions that improved on the work of the Wright Brothers.
- (4) The student analyzes

- (C) identify and describe features of a jet aircraft that came about as a result of jet engines;
 - (D) identify and summarize the origins of commercial airline service;
 - (E) summarize developments and innovations in navigation systems that occurred as aircraft began to be used for commercial purposes;
 - (F) summarize how lessons learned from the first failed airline services pointed the way to modern commercial airline flight; and
 - (G) analyze the impact of the jet engine on world travel and the social changes that came about as a result of international travel.
- (7) The student describes innovations of modern aircraft navigation and how these innovations impact the industry. The student is expected to:
- (A) explain how the “glass cockpit” and fly-by-wire innovations helped pilots fly airplanes more safely;
 - (B) investigate and identify features of Visual Flight Rules (VFR) on aeronautical charts;
 - (C) explain criteria for the use of composites in aircraft design;
 - (D) define various composite structural materials and identify ways in which composites are used in aviation and aerospace; and
 - (E) explain current navigational technology and predict what it might look like in the future.
- (8) The student summarizes current and possible future impact of the aviation and aerospace industry on the environment(E)

(E)

Recommended Resources and Materials:

Aircraft Owners and Pilots Association (AOPA) High School Aviation STEM Curriculum Project. Retrieved February 8, 2019 from <https://youcanfly.aopa.org/high-school/high-school-curriculum>

Federal Aviation Administration (Free downloadable PDF Aviation Handbooks) Retrieved February 8, 2019 from https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/

- Pilot Handbook of Aeronautical Knowledge FAA-H-8083-25B
- Airplane flying Handbook FAA-H-8083-3B
- Aeronautical Information Manual (AIM)
- Weather Services AC 00-45H
- Aviation Weather AC 00-6B
- Aeronautical Chart Users Guide
- Pilot Controller Glossary (with change 3) (Vocabulary)

National Aeronautics and Space Administration (NASA)

Various curriculum Ideas. Retrieved February 8, 2019 from <https://www.nasa.gov/offices/education/about/index.html>

NASA Johnson Space Center (Houston)

Various curriculum Ideas and tour information. Retrieved February 8, 2019 from <https://www.nasa.gov/offices/education/centers/johnson/home/index.html>

Organizations that support Youth in Aviation Education:

Experimental Aircraft Association (EAA). Retrieved February 8, 2019 from <https://www.eaa.org/ea>

Commemorative Air Force (CAF). Retrieved February 8, 2019 from <https://commemorativeairforce.org/pages/CAF-Education>

Civil Air Patrol. Retrieved from <https://www.gocivilairpatrol.com/programs/aerospace-education/join-as-an-aem>

Integrating Technology into classroom

The use of Commercially available full-sized motion, non-motion or desktop flight simulation equipment, or a desktop flight simulator using off the shelf products and software can enhance the learning of aviation concepts. Reinforcing that students should use simulation equipment as they would a real aircraft enhances learning of how pilots fly safely and instills good aeronautical decision making.

Recommended Course Activities:

- x written papers
- x industry interviews
- x multimedia videos
- x visits to industry sites

Suggested methods for evaluating student outcomes:

- x Tests, projects, and presentations.

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- x independent and group projects.
- x Presentations and written reports

Teacher qualifications:

- x Trade and Industrial Education: Grades 6-12
- x Trade and Industrial Education: Grades 8-12
- x Vocational Trades and Industry

Recommended experience in aviation such as Pilot Certificate, Airline Transport Certificate, Advanced Ground Instructor or Certified Flight Instructor certificate would be very helpful in teaching this course.

Additional information: