

Aviation (STEM) – Year 2

Instructor: Matthew Ranck

Grades: 10th-12th

Prerequisite: Aviation STEM Year 1

Fees: \$40/month tuition, plus a one-time \$40 supply fee

Textbook: Materials Provided

Course Description:

This course is designed to introduce high school students to all types of aviation careers, as well as introduce them to the science of flight thru STEM activities and lessons.

The AOPA curriculum information can be found at [High School Aviation STEM Curriculum - You Can Fly \(aopa.org\)](http://www.aopa.org/High-School-Aviation-STEM-Curriculum-You-Can-Fly)

1st Semester – Introduction to Flight

In the Introduction to Flight course, students pursuing the Pilot and UAS tracks will look closely at the aircraft they may one day operate. Students will begin with an exploration of the types of aircraft in use today before learning how aircraft are made and how they fly. Students will understand how aircraft are categorized, be able to identify their parts, and learn about aircraft construction techniques and materials. They will gain an in-depth understanding of the forces of flight—lift, weight, thrust, and drag—including how to make key calculations. They will then touch on aircraft design, looking at stability, aircraft controls, and maneuvering flight. The course will focus on career skills related to these topics.

2nd Semester – Aircraft Systems and Performance

In the Aircraft Systems and Performance course, students in the UAS and Pilot tracks will take an in-depth look at the systems that make crewed and uncrewed aircraft work. Beginning with aircraft powerplants and fuel systems, students will learn about the options available and how they affect aircraft design and performance. They will explore other key aircraft systems, including electrical, pitot-static, and vacuum systems. Throughout the course, they will learn about the flight instruments associated with each system and how to identify and troubleshoot common problems. This unit also covers aircraft flight manuals and required aircraft documents. Finally, students will learn about the factors that affect aircraft performance and how to determine critical operating data for aircraft.

This class curriculum is being taught by Matthew Ranck, P.E., C.M.

Mr. Ranck is a Registered Professional Engineer and works for Delta Airport Consultants in Oklahoma City as a consulting engineer for several General Aviation (GA) airports across Oklahoma and New Mexico. He is a Certified Member (CM) of the American Association of Airport Executives. Mr. Ranck is also a private pilot.