



AEROSCIENCE 1 & 2

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Conference Period: 1

Tutoring Opportunities: M-F, 1630-1800

Class Materials:

- Homework, handouts, etc. will be available via Canvas once the instructor has student email addresses
- Students must provide:
 - A 12" ruler, compass, and protractor
 - Black or dark blue business pens. These are the only colors permitted on graded items. ***Pencils, felt-tip, brightly colored pencils or pens, or anything that bleeds through the paper are unacceptable on all graded items. Using them results in a letter grade reduction***
 - (Optional) Light colored highlighters
 - Scientific calculator or cell phone calculator
 - Graph composition quad-ruled notebook to use as an Engineering Notebook (EN). Aero 2 students may continue with their Aero 1 EN ONLY if it was a graph composition quad-ruled one. ***Composition, spiral-ringed, ringed, ring-holed notebooks, or those with pages designed for easy removal are prohibited. Using them results in a letter grade reduction at each EN review until replaced with the correct EN***
- Access to Canvas and Office365 tools are available to students through our [Single Sign-on Portal \(SSO\)](#). Students receive their SSO login during enrollment

Course Description:

The class introduces students to aerospace engineering and aviation. It culminates in designing, building and flying rockets in national and international competitions or in sitting for a Federal Aviation Administration (FAA) commercial drone or basic ground school license.

Aero 1: Students learn flight fundamentals, aircraft, and rocket design. Engineering students verify their designs by building and launching Mid- or High-Power Rockets. Aviation students choose between aircraft or drone piloting and focus on aviation knowledge and flight operations. All aviation students fly in-class flight simulators, but drone pilot students also fly quad- and hex-copters. Aircraft pilot students attend mock interviews at HCTC with the American Airlines Pilot Recruiting Team in December.

Aero 2: Engineering students expand their Mid- or High-Power Rocket projects or build Experimental Class rockets designed to go 100,000 feet or to space (i.e., 62.5mi). Work is required outside normal classroom hours (nights, weekends, and summer) to permit launching on schedule at White Sands Missile Range, NM or Spaceport America, NM. Aviation students expand their aviation and flight operations knowledge. They attend the December mock interviews and in March, they attend actual job interviews at HCTC with the American Airlines Pilot Academy Recruiting Team for the opportunity to be accepted into their pilot training program leading to an exciting and highest paid US job available to a high school graduate.

Course Goals:

Students completing this course successfully will be able to:

- Determine whether they wish to seek an engineering or aviation career
- Know which colleges or aviation path best meets their needs
- Evaluate different future educational opportunities to keep costs to a minimum
- Learn techniques to get their first engineering or aviation career job

Student Evaluation:

The grading system for this course is:

- Grade averaged 60% Major 40% Minor
- Major grades – tests (including District Common Assessments, six weeks assessments, projects, final essays, research papers, presentations); minimum three per six weeks
- Minor grades – quizzes, daily assignments, journals; minimum four per six weeks
- Semester exams will count 1/7 of the semester grade
- A letter system (S, N, U) reports a student's conduct based on proper/responsive conduct and citizenship
- Per Board Policy EIA (LOCAL), "The District shall permit a student who meets the criteria detailed in the grading guidelines a reasonable opportunity to redo an assignment or retake a test for which the student received a **failing** grade. This policy applies only to initial identified major grades and does not apply to daily assignments, quizzes, six-week test, and semester final examinations. Upon reteach and retest, the new test, project, etc. recorded will be a high score of 70%."
- Official grades will be in Skyward only and can be accessed by student and parent through Family Access.

Assignments, exams, expectations outside of the classroom:

Students must read the Homework (HW) and complete the graded assignment prior to the class in which it is discussed. HW is due prior to the beginning of the class where it is discussed. Classroom HW discussion focuses on points where students express their problems. If students don't ask questions on a HW point during class that point remains testable even if not covered in class.

Project ENs replace individual ENs once teams form. Students receive a Project EN grade based on the team's overall grade +/- individual contribution points. The Project ENs will be printed (and be the only graded version) once we return to school. They will be placed in the school-provided three ring binder and teams must continue updating them on their team's collaborative site. Teams must keep versions of every document on the team collaborative site., not in the printed notebook. For example, anyone opening the Risk Management Assessment to edit it, must first save the document with its name followed by the next version number. Only after the new document name is created will it be edited, then saved.

Students will remain online the entire class period unless they receive prior instructor approval to logon during another Aero period. Such action should be rare, but would change an "absent" to "present".

Attendance/Tardy Policy/Make-Up Work:

- Classes last two periods (~75 minutes). An unexcused tardy after 15 minutes is an absence for the first period and present for the second. Unexcused tardiness after 52 minutes is an absence for both class periods
- Make-up work is permitted for excused failures to meet the original grading requirements. Excused failures include sickness, family death, etc. Make-up work is not permitted for homework assignments when the assignment is given at least two weeks in advance and the reason for missing the deadline is predictable. For example, an assignment is due in two weeks when a student is scheduled to be out of class at an away basketball game or is scheduled at the last minute to work at a part-time job the night before the due date. The student must turn in the assignment before the predictable event occurs.
- Make-up work is not permitted for graded events meeting outside organizations' schedules. For example, NASA reviews the Experimental Rockets at set milestone dates. There are no makeups for failing to meet NASA's review. Therefore, the rockets won't fly and the team receives a major failing grade +/- individual input if missing the date is due to the team's failure to remain on schedule

- Extra credit will not be considered if the student failed the original assignments or failed to do them on time

Classroom Expectations:

Creating a safety issue in the lab results in punishments ranging from requiring the offending students to remain in the classroom the remainder of the semester (and subsequent grades reduced because they can't get in the lab to perform the required work) to being disenrolled from the class without possibility of returning the following year. The lab contains highly explosive material, power equipment, and chemicals that can cause a significant disaster.

Preliminary Schedule of Topics, Readings, and Assignments

Provided readings are from:

- Rocket Propulsion Elements, 9th ed., *George P Sutton*
- Handbook of Model Rocketry, *Harry & Bill Stine*
- Fundamentals of Aerodynamics, 6th ed., *John Anderson*
- Modern High-Power Rocketry 2, *Mark Canepa*
- Basic Science for Aerospace Vehicles, 4th ed., Chap 1-4, Northrop Institute of Technology, *McKinley & Bent*

Academic Integrity:

Academic integrity values the work of individuals regardless if it is another student's work, a researcher, or author. The pursuit of learning requires each student to be responsible for his or her academic work. Academic dishonesty is not tolerated in our schools. Academic dishonesty, includes cheating, copying the work of another student, plagiarism, and unauthorized communication between students during an examination. The determination that a student has engaged in academic dishonesty shall be based on the judgment of the classroom teacher or other supervising professional employee and considers written materials, observation, or information from students. Students found to have engaged in academic dishonesty shall be subject to disciplinary and/or academic penalties. The teacher and campus administrator shall jointly determine such action.