

Aerospace Engineering (AE)

Mr. Blane Krause

2022-23 Course Syllabus

STA Main Line: 816-986-3410 **Attendance:** 816-986-3413 or email: andrea.bisogno@lsr7.net **Office:** 816-986-3437 **Mobile:** 816-946-2003

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Office Hours: 7:30 – 7:45 a.m. or 2:00 – 3:00 p.m., or by appointment

COURSE DESCRIPTION: Aerospace Engineering provides students with the fundamental knowledge and experience to apply mathematical, scientific, and engineering principles to the design, development, and evolution of aircraft, space vehicles and their operating systems. This course is part of the *Project Lead The Way* (PLTW) Engineering curriculum. In the classroom, students will engage in creative thinking and problem-solving activities using software that allows students to design, test, and evaluate a variety of air and space vehicles, their systems, and launching, guidance and control procedures. Students will build and test gliders, airfoils, model rockets and robots.

INSTRUCTIONAL PHILOSOPHY: This course is based on a series of activities and projects that reinforce the fundamentals of atmospheric and space flight. Students will utilize materials developed for and utilized by industry professionals. The focus of the materials is to prepare the student to become a self directed, lifetime learner, which includes developing the student's mathematics, science, technical reading and writing, critical analysis, and problem-solving skills. Several of the activities require teamwork and the use of appropriate business communications. Since the coursework is collegiate-level and focuses on current industry standards, professional conduct at all times is required.

AE ESSENTIAL STANDARDS:

1. Analyze the interaction of the four major forces of atmospheric flight.
2. Analyze aircraft stability and control.
3. Analyze the effect of weight on an aircraft.
4. Compare various propulsion systems and analyze their performance.
5. Design a rocket for stable flight.
6. Interpret aircraft navigation systems.
7. Analyze mechanical properties of materials used in aerospace industry.
8. Analyze how human factors affect aerospace system design.
9. Analyze how orbital mechanics theory can describe satellite motion.
10. Explain how unmanned systems can be integrated into aerospace systems.

ENGINEERING ESSENTIAL

STANDARDS: 1. Demonstrate independent

thinking and self direction in pursuit of accomplishing a goal. 2. Apply and document the engineering design process.

3. Select and use appropriate tools and technology to support engineering work.
4. Create and use conceptual, graphical, virtual, mathematical and physical models to represent, evaluate and communicate technical content.
5. Apply mathematics and science to promote problem solving and design decisions.
6. Draw from engineering experience to recognize the appropriate application of cross disciplinary knowledge to support unique interdisciplinary solutions.
7. Conduct self in a manner consistent with engineering professionals, guided by professional ethics and standards.

MAJOR ASSIGNMENTS/PROJECTS:

1. Daily Work/Quizzes/Tests
2. Airfoil Testing
3. Glider Design
4. Flight Simulator
5. Rocket Design
6. Orbital Mechanics Physics
7. Mars Rover
8. Satellite Flight Data
9. PLTW End Of Course Exam

ASSESSMENT PLAN: Daily and weekly formative assessments will be used to identify whether students are attaining the essential learning targets on a daily basis. Quizzes, skills exams, and knowledge exams will be utilized to prepare students for the PLTW End of Course (EOC) exam. Summative assessments will be given, including a comprehensive final at the end of the course that shows achievement of the essential

standards and concepts accomplished.

GRADING POLICY: Grades will be figured using the Summit Technology Academy approved grading scale. Grades are cumulative throughout the semester. Semester grades (A1) will be based on the following:

Classwork/Homework	15%
Projects	30%
Quizzes	15%
Exam	30%
Math	10%

A comprehensive final will comprise 10% of the semester grade (S1).

Note: Any assignment, be it a paper, quiz, etc., that is not turned in (hard copy and/or electronic) as per the due date and time or as prescribed in this syllabus will receive a ZERO!

The following standardized grading scale is used for STA:

A 95 -100 C 73 - 76
A- 90 - 94 C- 70 - 72
B+ 87 - 89 D+ 67 - 69
B 83 - 86 D 63 - 66
B- 80 - 82 D- 60 - 62
C+ 77 - 79 F 59 & below (No Credit)

TUTORING/EXTRA HELP PLAN: STA utilizes a pyramid of interventions in order to ensure students successfully meet the course requirements. Tutoring or extra help can be obtained by contacting the STA teacher through e-mail, phone or in person. The teacher and student will agree on the arrangements.

ATTENDANCE POLICY: Regular attendance reflects dependability. The experience gained by students in the laboratory cannot be duplicated in the event of absence. **Summit Technology Academy's policy may differ from that of the sending school and will be in effect for the period of attendance at STA.** Please reference the on-line [STA Student Handbook](#) for the most current policy. Absences must be reported by parents or guardians to STA by calling 986-3413 or email andrea.bisogno@lsr7.net. Andrea Bisogno is the attendance secretary at STA.

A student shall be allowed no more than nine (9) absences, excused or unexcused, per semester in any one class. When a student reaches 9 days, the school will send an informational letter to the parents, regardless of prior contact by phone or conference. The letter serves as notification of the number and type of absences by the student in each class. On the tenth (10) absence, in any one class, the student will not earn credit for that class. Students will have the opportunity to work with their administrator or teacher to make up missed time prior to the end of the semester. If a student still has 10 or more absences at the conclusion of the semester the student will be required to complete an attendance waiver appeal. A waiver to maintain full credit must be submitted by the end of the semester. This waiver should include documentation of illness, funeral, or family emergency from a medical doctor, dentist, minister, or other official source. The waiver should be turned into the attendance office.

ELECTRONIC GRADEBOOK/POWER SCHOOL WEBSITE: Grades are updated on a weekly basis. The Power School website address is <https://powerschool.lsr7.org/public/>.

ACADEMIC LETTERING: Students who have earned a 94.5% or higher in a STA program for first semester and a 94.5% or higher grade at the time of the fifth grading period will receive the academic letter.

TARDY POLICY: A tardy will be issued in accordance with the student handbook. Students are on time if they are seated in the classroom at the time of the bell.

DRIVING PRIVILEGES: Students are strongly encouraged to utilize bus transportation when provided. However, students are permitted to park on school premises with a valid STA or UCM parking permit. Student parking on-site is a privilege, and can be revoked. Students parking/driving to STA without permission from their sending school and STA will be subject to disciplinary action. Parking permits may be revoked if a student is frequently tardy or late to school. (See tardy or late to school policies.)

ELECTRONICS POLICY: No electronics or headphones are allowed in the classroom unless being used in the educational process or as directed by the instructor. Electronics should be placed in backpacks or purses and out of sight. Students are encouraged to interact and help one another when appropriate.

DAILY MATERIALS NEEDED:

- Notebook, Folder, and/or Binder (personal preference)
- Engineering Notebook (provided by STA)
- Scientific calculator
- Pencil(s) and pen(s)

TECHNOLOGY: Students are required to utilize technology for various assignments. Outside computer and internet access is required.

LATE WORK: No late work is accepted.