

# Aerospace Engineering (AE)

*Mrs. Hope MacKenzie*

*2018-19 Course Syllabus*

**STA Main Line:** 816-986-3410

**Office:** 816-986-3432

**E-mail:** [hope.mackenzie@lsr7.net](mailto:hope.mackenzie@lsr7.net)

**Office Hours:** 7:10 – 7:40 a.m. or 2:00 – 2:50 p.m., or by appointment

**Attendance:** 816-986-3413

**FAX:** 816-986-3435

**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 model rockets, gliders, airfoils, robots, and fiberglass composite samples.

**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.

## **ESSENTIAL STANDARDS:**

1. Identify the major components of an aircraft.
2. Describe the four major forces which act on an aircraft.
3. Explain how an aircraft reacts to flight control inputs.
4. Use a navigation aid to fly an aircraft to a destination in a simulated environment.
5. Describe the characteristics of the four types of propulsion systems.
6. Analyze how human factors affect aerospace system design.
7. Analyze how orbital mechanics theory can describe satellite motion.
8. Explain how unmanned systems can be integrated into aerospace systems.
9. Organize and express thoughts and information in a clear and concise manner.
10. Deliver organized presentations.

## **MAJOR ASSIGNMENTS/PROJECTS:**

1. Daily Work/Quizzes/Tests
2. Airfoil Testing
3. Glider Design
4. Flight Simulator
5. Composite Sample Testing
6. Rocket Design
7. Orbital Mechanics Physics
8. Mars Rover
9. Satellite Flight Data
10. Fly-By-Wire Autopilot
11. 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. Online 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 will be based on the following:

1. Classwork/Homework: 10%
2. Projects: 30%
3. Engineering Notebook: 15%
4. Quizzes: 15%
5. Exams: 30%

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

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)

Colleges use a four point system of grading (A= 4, B=3, C=2, D=1, F=0) without a minus and plus option.

**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 student handbook for the most current policy at <http://sta.lsr7.org>. Absences must be reported by parents or guardians to STA by calling 986-3413. Janie Joling 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 <http://www.lsr7.org/parents/power-school/>.

**ACADEMIC LETTERING:** Students who have earned a 95% or higher in a STA program for first semester and a 95% or higher grade at the time of the fifth grading period will receive the academic letter.



## **ADDENDUM TO COURSE SYLLABUS**

**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:** Driving to STA is a privilege and can be revoked at any time. Students are allowed to drive to STA as long as their sending school allows them to drive and a permit is on file. Driving permits may be revoked if a student is frequently tardy, late to school, or exhibits irresponsible driving practices upon entering, or leaving STA, etc.

**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:**

- Engineering notebook
- Scientific calculator
- Pencil(s) and pen(s)
- Flash drive (2GB minimum)

**TECHNOLOGY:** Students are required to utilize technology for various assignments.

**LATE WORK:** No late work is accepted.