

Syllabus – Principles of Aerospace Science II

Course Description: This science elective course is a second-year course on the concepts of aerospace science. It covers the more advanced principles of flight, the physiology of flight, air navigation and air traffic control, and orbits and rocketry. NOTE: Academy courses are integrated, so concepts covered in this course will be reinforced in Geometry, 8th Grade Science, and Innovations in Aerospace II.

Essential Questions:

1. How and why have aircraft designs changed over time?
2. How is a remote controlled airplane or drone controlled so that it can takeoff, climb, turn, descend, and land?
3. How do forces act on an airplane and change during flight?
4. How does an aircraft propulsion system exert force?
5. How do different bridge designs spread the load on the bridge, and how do these designs relate to aircraft design.
6. What are G forces and how are they caused?
7. Why do astronauts feel weightless in orbit?
8. How could G forces cause problems for human reproduction or genetic health?
9. How could weightlessness cause problems for human reproduction or genetic health, especially on a long duration spaceflight?
10. How do I read and use a map or chart?
11. How do objects in the sky help me navigate?
12. How is time measured and used for navigation?
13. How is a magnetic compass used to find direction?
14. How do I plan out a route of flight for an airplane, then fly that route?
15. How is air traffic controlled to make flying safe?
16. How does a satellite attain orbit?
17. How do satellite orbits relate to the Solar System?
18. How do satellite orbits differ, and how do these differences affect satellite control?
19. How can a rocket be controlled?
20. How can I safely operate a model rocket

Class Rules and Expectations:

Students are part of John Wallace Middle School and will follow the PRIDE pillars each day:

- **Preparation** for class and for life after school.
- **Respect** for self and for others.
- **Integrity** in all actions.
- **Determination** to successfully complete whatever is begun.
- **Excellence** in everything we do.

Students are expected to:

- Strive to do their best each day.
- Work as a team.
- Be model citizens.
- Keep an open and inquisitive mind.
- Be committed to their work and to the academy.

Contacting Mr. Holmes:

The best way to contact me outside of school is to email me at bholmes@npsct.org , and I will respond within 24 hours.

Grading Scale and Policy:

Every student has the opportunity to do well in this course, if you do your own work and keep up with assignments. Assignments and grades will be updated weekly in PowerSchool. Your course grade will be based on the following percentages:

Labs and projects	50%
Quizzes	30%
Homework and classwork	20%

Labs:

We will do some sort of lab activity a few times per month. Lab procedures and the lab report will be the same as those used in science class, and the labs will be kept in the same lab notebook, graded with the same lab report rubric.

Projects:

During each unit, I want you to explore a topic in a project that interests you and to share your discoveries with the class. Project assignments with rubrics will be provided far enough in advance of the due date to give adequate time to complete the project. We will also do engineering design projects following an engineering design process. These projects may include a product you made and will always require a portfolio documenting your work in your engineering notebook, graded using the engineering design process rubric.

Quizzes:

I will give short quizzes in different formats at the end of units, and these will help us both see how your learning is progressing.

Homework:

Homework will require you to take notes on something you read or watch that prepares you for class the next day, and it will be graded based on proof of completion—for example, if you were supposed to watch a video, then the next day your discussion inputs will show this knowledge.

Class Work:

You will do many types of class work, and any work you do will receive credit. Participating and making an effort to learn should be your daily goals.

Attendance and Makeup Policy:

Please keep me informed about any absences. Whether you have an excused or unexcused absence, you must make up work you missed. Most work will be available online, so you may view what you missed and make it up before returning to class. Please turn in missing work no later than the day after you return from an absence, as this will give you one day to ask any questions or to get help--exceptions will be on a case-by-case basis. The grade for any missing work is "0."