

DENBIGH HIGH SCHOOL **Aviation Academy**

MAGNET PROGRAM



Course Guide

2023-2024



NEWPORT NEWS



PUBLIC SCHOOLS



CONTENTS

About the Magnet Program	4
Program Strands	5
Pathways for 2023-2024	
<i>Aviation Technology</i>	6
<i>Flight Operations</i>	7
<i>Aerospace Engineering</i>	8
Aviation Academy Course Offerings	9
Types of Diploma Seals	12
Industry Certifications Offered at Aviation Academy	12

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ABOUT THE MAGNET PROGRAM

DENBIGH HIGH SCHOOL **Aviation Academy** MAGNET PROGRAM



DISTINCTIVE FEATURES

- “Airport campus” at Denbigh High School
- Small community of learning with a collegiate atmosphere
- State of the art technology that includes: Flight Simulator Lab, 3D Printer Lab, Drone Room, Virtual Reality (VR) Lab, Engineering Lab and aviation Maintenance Technician (AMT) Lab
- Aviation classes offered in Aerospace Technology, Pilot Training, Air Traffic Control, Aviation Maintenance Technology, Aviation Operation Management, Criminal Justice and Public Safety in Aviation
- Focus on bridging student skills to match the demands of the workforce
- Mirrors best practices often seen in successful 21st Century employees



WHAT IS THE AVIATION MAGNET?

Denbigh High School’s Aviation Academy is a highly-specialized four-year program that prepares highly-motivated and successful high school students for a rewarding and well-paying career in and around the field of Aviation and STEM. Standards are high at the Aviation Academy, and every effort is made to provide a caring, disciplined environment. Students are given the opportunity to excel and achieve their goals. Courses provide rigorous subject material to enhance students’ problem-solving, innovation and collaborative skills through student-centered activities.

The Aviation Academy strongly encourages students to work toward an advanced studies diploma. All students are required to take physics, chemistry and four years of math. The expectation is to take at least one AP course and at least two honors classes annually. Students who achieve a “B” average in math and obtain certification in an approved course completer series will be awarded an Advanced Math and Technology seal on their diploma. Aviation Academy staff members set high expectations for students preparing for college and highly skilled, professional career fields with a lucrative salary.



PROGRAM STRANDS FOR 2023-2024

All aviation students will follow the advanced diploma track in addition to the required Aviation courses.

9th Grade Aviation Courses	10th Grade Aviation Courses	11th Grade Aviation Courses	12th Grade Aviation Courses
AVIATION TECHNOLOGY Students learn the terminology, concepts and procedures through hands-on experiences that blend in the dynamics of the aircraft. By completing this sequence they are prepared to take the General Maintenance Technician certification after graduation.			
• Aerospace Technology I	• Aerospace Technology II	• Aviation Maintenance Technology I	• Aviation Maintenance Technology II (Honors)
FLIGHT OPERATIONS Students learn vital and pertinent knowledge, ranging from the classroom portion of pilot ground school to learning to fly aircrafts and airport operations. Courses also involve an understanding of FAA guidelines that prepares them for their respective FAA certification exam..			
• Aerospace Technology I	• Aircraft Pilot Training	• Aircraft Pilot Training II (Honors)	• Unmanned Aircraft Systems (Honors)
AEROSPACE ENGINEERING Through Project Lead The Way, Aviation students learn the process of Aerospace Engineering through courses such as Introduction to Engineering Design – Aerospace, Digital Electronics, Aerospace Engineering and Engineering Design and Development Capstone.			
• Introduction to Engineering Design - Aerospace	• Digital Electronics (Honors)	• Aerospace Engineering	• Engineering Design and Development Capstone (Honors)

Students have the opportunity to earn industry certifications in each program strand.

AVIATION TECHNOLOGY CONCENTRATION WITH AN ADVANCED DIPLOMA

9th Grade	10th Grade	11th Grade	12th Grade
Math (<i>Choose 1</i>) • Algebra I • Honors Geometry • Honors Algebra II	Math (<i>Choose 1</i>) • Honors or Regular Geometry • Honors or Regular Algebra II • Pre-Calculus	Math (<i>Choose 1</i>) • Algebra II • Algebra II/Trigometry • Pre-Calculus • Calculus	Math (<i>Choose 1</i>) • Pre-Calculus • Calculus • AP Statistics
• Honors Earth Science • AP Environmental Science	• Honors Physics • AP Physics	Science (<i>Choose 1</i>) • AP or Honors Chemistry • AP or Honors Biology	Science • Any AP or Honors Science Class
9 Honors English	10 Honors English	English (<i>Choose 1</i>) • 11 Honors English • AP English	English (<i>Choose 1</i>) • 12 Honors English • AP English
Social Studies (<i>Choose 1</i>) • Honors World Geography • AP Human Geography	Social Studies (<i>Choose 1</i>) • Honors World History • AP World History	Social Studies (<i>Choose 1</i>) • Honors US History • AP US History	Social Studies (<i>Choose 1</i>) • Honors Government • AP Government
Physical Education I Health I	Physical Education II Health II	Foreign Language Requirement	Personal Finance Class
Foreign Language Requirement	Foreign Language Requirement	Aviation Maintenance Technology (AMT) I	Aviation Maintenance Technology (AMT) II <i>Honors</i>
Aerospace Technology I	Aerospace Technology II	AMT I - Double Block	AMT II - Double Block <i>Honors</i>

Possible Electives to take in Addition to Required Coursework:

Aircraft Pilot Training I, Introduction to Engineering Design - Aerospace, Unmanned Aircraft Systems



Possible Careers with this Track	Median Salary by Job
Aerospace Engineer	\$75,144
Electrical Engineer	\$67,465
Mechanic Aircraft	\$49,129
Aircraft Mechanic / Service Technician	\$43,056
Source: www.payscale.com	

FLIGHT OPERATIONS CONCENTRATION

WITH AN ADVANCED DIPLOMA

9th Grade	10th Grade	11th Grade	12th Grade
Math (<i>Choose 1</i>) • Algebra I • Honors Geometry • Honors Algebra II	Math (<i>Choose 1</i>) • Honors or Regular Geometry • Honors or Regular Algebra II • Pre-Calculus	Math (<i>Choose 1</i>) • Algebra II • Algebra II/Trigonometry • Pre-Calculus • Calculus	Math (<i>Choose 1</i>) • Trig/Elementary Functions • Pre-Calculus • Calculus • AP Statistics
• Honors Earth Science • AP Environmental Science	• Honors Physics • AP Physics	Science (<i>Choose 1</i>) • AP or Honors Chemistry • AP or Honors Biology	Science • Any AP or Honors Science Class
9 Honors English	10 Honors English	English (<i>Choose 1</i>) • 11 Honors English • AP English	English (<i>Choose 1</i>) • 12 Honors English • AP English
Social Studies (<i>Choose 1</i>) • Honors World Geography • AP Human Geography	Social Studies (<i>Choose 1</i>) • Honors World History • AP World History	Social Studies (<i>Choose 1</i>) • Honors US History • AP US History	Social Studies (<i>Choose 1</i>) • Honors Government • AP Government
Physical Education I Health I	Physical Education II* Health II	Foreign Language Requirement	Personal Finance Class*
Foreign Language Requirement	Foreign Language Requirement	Aircraft Pilot Training II (Double Block) <i>Honors</i>	Unmanned Aircraft Systems <i>Honors</i>
Aerospace Technology I	Aircraft Pilot Training I (Double Block) <i>Honors</i>	Aircraft Pilot Training II (Double Block) <i>Honors</i>	Aviation or AP Elective
Possible Electives to take in Addition to Required Coursework: Aviation Maintenance Technology I, Aerospace Technology II, Introduction to Engineering Design - Aerospace, Unmanned Aircraft Systems			
* Please refer to the "You've Got Options" campaign to fit courses in your schedule.			



Possible Careers with this Track	Median Salary by Job
Airline Pilot, Copilot or Flight Engineer	\$85,000
General/Operations Manager	\$57,937
Air Traffic Controller	\$57,325
Aircraft Electrician	\$49,629
Source: www.payscale.com	

AEROSPACE ENGINEERING - CONCENTRATION WITH AN ADVANCED DIPLOMA

9th Grade	10th Grade	11th Grade	12th Grade
Math (<i>Choose 1</i>) • Algebra I • Honors Geometry • Honors Algebra II	Math (<i>Choose 1</i>) • Honors or Regular Geometry • Honors or Regular Algebra II • Pre-Calculus	Math (<i>Choose 1</i>) • Algebra II • Algebra II/Trigometry • Pre-Calculus • Calculus	Math (<i>Choose 1</i>) • Pre-Calculus • Calculus • AP Statistics
• Honors Earth Science • AP Environmental Science	• Honors Physics • AP Physics	Science (<i>Choose 1</i>) • AP or Honors Chemistry • AP or Honors Biology	Science • Any AP or Honors Science Class
9 Honors English	10 Honors English	English (<i>Choose 1</i>) • 11 Honors English • AP English	English (<i>Choose 1</i>) • 12 Honors English • AP English
Social Studies (<i>Choose 1</i>) • Honors World Geography • AP Human Geography	Social Studies (<i>Choose 1</i>) • Honors World History • AP World History	Social Studies (<i>Choose 1</i>) • Honors US History • AP US History	Social Studies (<i>Choose 1</i>) • Honors Government • AP Government
Physical Education I Health I	Physical Education II Health II	Foreign Language Requirement	Personal Finance Class
Foreign Language Requirement	Foreign Language Requirement	Aerospace Engineering	Engineering Design & Development Capstone Honors
Introduction to Engineering Design Aerospace	Digital Electronics Honors	Aviation Elective	Aviation Elective
Possible Electives to take in Addition to Required Coursework: Aerospace Technology I, Public Law in Aviation I, Aircraft Pilot Training I			

Possible Careers with this Track	Median Salary by Job
Aerospace Electrical Engineer	\$75,144
Engineer	\$67,465
Aircraft Electrician	\$49,629
Source: www.payscale.com	

AVIATION COURSE OFFERINGS

AEROSPACE ENGINEERING

AV1130

Prerequisites: Digital Electronics

Grade Level: 11 or 12

Credit: ½ credit per semester

Period: Single Block

This course propels students' learning in the fundamentals of atmospheric and space flight. As they explore the physics of flight, students bring the concepts to life by designing an airfoil, propulsion system, and rockets. They learn basic orbital mechanics using industry-standard software. They also explore robot systems through projects such as remotely operated vehicles.

AEROSPACE TECHNOLOGY I

AV1210

Prerequisites: None

Grade Level: 9-12

Credit: ½ credit per semester

Period: Single Block

This course is designed to be an introduction with basic knowledge of the career field of aerospace. Students will learn about the history of aviation, principles of flight, careers in aviation and aerospace.

AEROSPACE TECHNOLOGY II

AV1220

Prerequisites: None

Grade Level: 10-12

Credit: ½ credit per semester

Period: Single Block

This course is designed to introduce students to aviation composites and materials for structure. It is a class that incorporates hands-on activities. It will help students see the vast careers available to them. Vocabulary, proper tool use and identification, and design are a few of the skills developed in this course.

AVIATION MAINTENANCE TECHNOLOGY I (AMT)

AV1230

Prerequisites: Physics

Grade Level: 10-12

Credit: ½ credit per semester

Periods: Double Block

This Airframe and Powerplant Technician General course is the first segment of training as an aviation maintenance technician. Students will learn the basic terms, concepts, and procedures that serve as the foundation for the more complex lessons to come. Students will obtain an understanding and incorporate hands on experience in mathematics, basic physics, mechanic privileges and limitations, maintenance publication, maintenance forms and records, basic electricity and ground operations and servicing. AV1230 is required for General Maintenance Technician courses to be successfully completed before starting the Airframe and Powerplant courses for certification.



Prerequisites: Physics**Grade Level:** 10-12**Credit:** 1 credit per semester**Periods:** Double Blocked

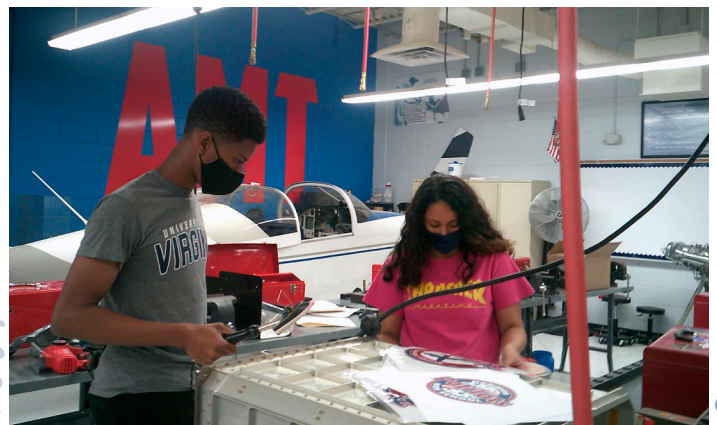
This Airframe and Powerplant Technician General Course is the other segment of training as an aviation maintenance technician. Students will learn the basic terms, concepts, and procedures that serve as the foundation and incorporate hands-on experience in aircraft drawings, weight and balance, fluid lines and fittings, materials and processes, and cleaning and corrosion. AV1240 is required for the FAA General Maintenance Technician courses to be successfully completed before starting the Airframe and Powerplant course for certification.

AIRCRAFT PILOT TRAINING I**AV1310****Prerequisites:** None**Grade Level:** 10-12**Credit:** ½ credit per semester**Period:** Single Block

Students will obtain knowledge necessary to complete the FAA Private Pilot Airplane Written Examination which includes flight simulation lessons that support the ground lessons. This course covers Aerodynamic Principles, Powerplant and Related Systems, Flight Instruments Aircraft Performance, Weather Theory, Weather Reports and Forecasts, Federal Aviation Regulations, National Transportation Safety Board, VFR Charts, Airspace, Airport Markings and Operations, Radio Communication, Pilot age and Dead-reckoning Navigation, Radio Navigation, Flight Planning, flight Physiology, as well as hands-on activities.

AIRCRAFT PILOT TRAINING II (Honors)**AV1350****Prerequisites:** Aviation Pilot Training I**Grade Level:** 11-12**Credit:** ½ credit per semester**Period:** Double Blocked

Students continue their pursuit in learning more about the pilot career and build on prior information learned in the Aircraft Pilot Training I course. In support of the flight syllabus, students participate in flight training, ground school, and simulator instruction while studying meteorology, aerodynamics, navigation, physiology, airfield and flight environments, aircraft maneuvers, and aircraft weight and balance.



DIGITAL ELECTRONICS (Honors)

AV1120

Prerequisites: Introduction to Engineering Design-Aviation

Grade Level: 10-12

Credit: ½ credit per semester

Period: Single Block

From smart phones to appliances, digital circuits are all around us. This course provides a foundation for students who are interested in electrical engineering, electronics, or circuit design. Students study topics such as combinational and sequential logic and are exposed to circuit design tools used in industry, including logic gates, integrated circuits, and programmable logic devices.

ENGINEERING DESIGN AND DEVELOPMENT - CAPSTONE (Honors)

AV1150

Prerequisites: Aerospace Engineering

Grade Level: 12

Credit: ½ credit per semester

Period: Single Block

The knowledge and skills students acquire throughout PLTW Engineering come together in EDD as they identify an issue and then research, design, and test a solution. Ultimately will present their solution to a panel of engineers. Students apply the professional skills they have developed to document a design process to standards. By completing EDD, students will be ready to take on any post-secondary program or career.

INTRODUCTION TO ENGINEERING DESIGN - AEROSPACE

AV1110

Prerequisites: None

Grade Level: 9-12

Credit: ½ credit per semester

Period: Single Block

Students dig deep into the engineering design process, applying math, science, and engineering standards to hands-on projects. They work both individually and in teams to design solutions to a variety of problems using 3D modeling software and use an engineering notebook to document their work.



TYPES OF DIPLOMA SEALS

Students are eligible to earn the Aviation Academy seal and /or the Career and Technical Education Seal. Please refer to the criteria below to determine eligibility.

DENBIGH HIGH SCHOOL AVIATION ACADEMY - MAGNET SEAL

- Fulfill requirements for Standard or Advanced Studies Diploma
- Complete Prescribed Career Strand
- Fulfill Community Service Hours/Internship
- Maintain a 3.0 GPA or higher
- Pass an exam that confers industry certification



CAREER AND TECHNICAL EDUCATIONAL SEAL

- Fulfill requirements for Standard or Advanced Studies Diploma
- Complete prescribed sequence of courses in a CTE concentration or specialization
- Meet one of the following conditions:
 1. Maintain a "B" or better in CTE courses
 2. Pass an exam that confers certification
 3. Acquire a professional license in a career and technical field



INDUSRY CERTIFICATIONS OFFERED

Students have the opportunity to earn industry certifications once they have met the criteria. The following is a list of the current industry certifications offered at Aviation Academy.

Pathway & Courses Associated	Possible Certifications, Licenses and Opportunities Offered
Aviation Technology <ul style="list-style-type: none"> • AMT 1 • AMT 2 	<ul style="list-style-type: none"> • For all course completer courses – CTECS Workplace Readiness Skills for the Commonwealth
Flight Operations <ul style="list-style-type: none"> • Aircraft Pilot Training I & II 	<ul style="list-style-type: none"> • FAA Private Pilot Practical Test – This is a professional license that students can acquire outside of class. • 2.5 hours of flight time may be earned if approved by the instructor • For all course completer courses – CTECS Workplace Readiness Skills for the Commonwealth
Aerospace Engineering	<ul style="list-style-type: none"> • For all course completer courses – CTECS Workplace Readiness Skills for the Commonwealth • PLTW End of Course Test • CAD Assessment
Flight Operations <ul style="list-style-type: none"> • Unmanned Aircraft Systems 	<ul style="list-style-type: none"> • FAA Part 107 Remote Pilot Certificate • For all course completer courses – CTECS Workplace Readiness Skills for the Commonwealth







