

# 09\_Avionics and Flight Instruments

Content Area: **Technology**  
Course(s):  
Time Period: **Full Year**  
Length: **14 Days**  
Status: **Published**

## **General Overview, Course Description or Course Philosophy**

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In the first semester, students learned about the importance of air pressure in making aircraft fly. Now they will expand their understanding of air pressure by examining pitot-static systems used to supply key information about airspeed and altitude. Students will learn how pitot-static systems are designed, how they function, the types of instrumentation they supply, and how to troubleshoot common problems. In some aircraft, gyroscopic instruments such as heading indicators, attitude indicators, and turn coordinators may be driven by a vacuum system. Students will learn how vacuum systems function, the types of instruments they drive, and how to troubleshoot common problems. Even in today's world of electronic navigation, the magnetic compass is an essential tool for pilots. Students will learn about the cardinal directions, principles of magnetism, errors associated with magnetic compasses in aircraft, and how to determine a flight course using a magnetic compass.

## **OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS**

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Objectives, essential questions and enduring understandings are outlined within each unit of study and/or Curricular Calendar.

Units of Study: <https://drive.google.com/drive/folders/11Q8sFu-T8ZX9O-2dZC7LEy8PaMNVtJnX?usp=sharing>

## **CONTENT AREA STANDARDS**

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MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.6	Attend to precision.
MA.K-12.8	Look for and express regularity in repeated reasoning.
LA.RST.9-10.2	Determine the central ideas, themes, or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
LA.RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions

defined in the text.

LA.RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.
LA.RST.9-10.5	Analyze the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).
LA.RST.9-10.8	Determine if the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.
LA.WHST.9-10.1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant sufficient textual and non-textual evidence.
LA.WHST.9-10.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
LA.WHST.9-10.6	Use technology, including the Internet, to produce, share, and update writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
SCI.HS-PS1-5	Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.
LA.WHST.9-10.8	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
LA.WHST.9-10.9	Draw evidence from informational texts to support analysis, reflection, and research.
SCI.HS-PS3-2	Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects).
SCI.HS-PS3-5	Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.
SCI.HS-PS4-2	Evaluate questions about the advantages of using a digital transmission and storage of information.
SCI.HS-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
SCI.HS-ETS1-4	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
CS.9-12.8.2.12.ED.1	Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers.
CS.9-12.8.2.12.ED.4	Design a product or system that addresses a global problem and document decisions made based on research, constraints, trade-offs, and aesthetic and ethical considerations and share this information with an appropriate audience.
TECH.8.1.12.A.2	Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.
TECH.8.2.12.C.7	Use a design process to devise a technological product or system that addresses a global problem, provide research, identify trade-offs and constraints, and document the process through drawings that include data and materials.
TECH.8.2.12.D.1	Design and create a prototype to solve a real world problem using a design process, identify constraints addressed during the creation of the prototype, identify trade-offs

made, and present the solution for peer review.

## **RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)**

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CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.
9-12.HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
9-12.HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
9-12.HS-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

## **STUDENT LEARNING TARGETS**

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Student learning targets are outlined within each unit of study and/or Curricular Calendar.

## **Declarative Knowledge**

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Declarative knowledge is outlined within each unit of study and/or Curricular Calendar.

## **Procedural Knowledge**

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Procedure knowledge is outlined within each unit of study and/or Curricular Calendar.

## **EVIDENCE OF LEARNING**

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## **Formative Assessments**

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Formative assessments are included and outlined in each unit of study.

## **Summative Assessments**

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Summative assessments are included and outlined in each unit of study.

## **RESOURCES (Instructional, Supplemental, Intervention Materials)**

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Materials and resources are outlined in each unit of study.

## **INTERDISCIPLINARY CONNECTIONS**

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Interdisciplinary connections are outlined in each unit of study.

## **ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS**

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Accommodations & Modifications are outlined in each unit of study.