Course Overview

High School | Robotics II - *Last Updated on April 4, 2025*

DESCRIPTION

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K-12 Content Area | Mission & Philosophy Statement
• Young people are born investigators, with natural curiosities about the physical, biological, and social worlds they experience. Anchoring science learning in real-world phenomena connects curiosities to core conceptual understandings. • Students actively construct understanding through inquiry, experimentation, and analysis to develop science and engineering practices such as asking questions, planning and carrying out investigations, and constructing explanations. • Integration of crosscutting concepts such as patterns, cause and effect, and systems thinking promote interdisciplinary understanding and sense-making of the natural world. • Science learning occurs alongside other disciplines to foster holistic understanding and application of knowledge.

Course Description
The High School Robotics II course offers students the ability to specialize in an area of robot development and creation. The course provides a student the ability to further understandings gained in AP CSA, Robotics I, or from other experiences. The course uses the *FIRST* Tech Challenge as a "hard problem" to inspire creativity and develop grit. This course provides the opportunity to apply the engineering design process to a unique problem. Each student will choose to specialize in project management, design & fabrication, mechanical engineering, or control systems. Together they will form a team to complete a team designed robot and required documentation in order to compete in an FTC qualifying event.

STANDARDS

Pennsylvania - Grade 9-12 - Science, Technology & Engineering, And Environmental Literacy & Sustainability Standards (STEELS) (2023)

3.2.9-12.Q | 3.5.9-12.B | 3.5.9-12.G | 3.5.9-12.I | 3.5.9-12.J | 3.5.9-12.L | 3.5.9-12.N

3.5.9-12.O | 3.5.9-12.P | 3.5.9-12.Q | 3.5.9-12.S | 3.5.9-12.V | 3.5.9-12.W | 3.5.9-12.X

3.5.9-12.Y | 3.5.9-12.AA | 3.5.9-12.DD | 3.5.9-12.LL | 3.5.9-12.OO | 3.5.9-12.PP

COURSE OBJECTIVES

The objectives are the course are to meet the Pennsylvania State Standards in Science and Technology.

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ASSESSMENT TYPES

The following assessment types will be used during the course:

- Curriculum-based measures
- Benchmark Assessments
- Formative Assessments
- Summative Assessments
- Performance-Based Assessments

SUGGESTED METHODS OF INSTRUCTION

A science program demands the use of a variety of instructional strategies to foster scientific thinking. Below is a list of suggested strategies for high-quality instruction:

- Instructional components outlined in the *Framework for Teaching* by Charlotte Danielson
- Hands-on learning
- Posing questions for investigation
- Cooperative learning and collaboration
- Inquiry, engineering, and design

RESOURCES

District Approved Program Resources	District Approved Supplemental Resources	District Approved Technology Resources
• Current FTC Manuals • Current FTC Game Set • Robotics Workshop	• Teacher Created Resources • District approved supplemental resources and labs	• District approved supplemental technology • Laptop Computers • Internet Access