



SOUTHERN LEHIGH SCHOOL DISTRICT
5775 Main Street
Center Valley, PA 18034

Planned Course for Technology Education/STEM

Course: Computer Aided Drafting and Design

Standards:

This course is aligned to standards within the following categories of the Pennsylvania Academic Standards for Science and Technology and Engineering Education:

- 3.4.A Scope of Technology
- 3.4.B Technology and Society
- 3.4.C Technology and Engineering Design
- 3.4.D Abilities for a Technological World
- 3.4.E The Designed World

Course Description:

The 4-12 Technology Education/STEM program within Southern Lehigh School District will provide an authentic and hands-on learning experience for all students. Courses are designed to empower students to develop, refine, and apply technological solutions focused on improving the world around them. Students will work collaboratively to make sense of and solve problems. Learning experiences will be inquiry-based, challenging students to reflect upon and revise their thinking. Teachers will provide opportunities for students to apply technology, as well as concepts from science and mathematics, to the engineering and design processes.

In COMPUTER AIDED DRAFTING AND DESIGN, students will learn what engineers do. They will also learn about the different types of engineering and the specific tools used by engineers during their work. Computer Aided Design (CAD) is a critical tool engineers use to transfer their napkin sketch ideas into actual three-dimensional models. Rhinoceros and AutoCad are powerful software packages that allow engineers to design parts, create assemblies, animate assemblies and create real life renderings of their models. Students will use these programs to design their own Formula One Dragster and use online aerodynamic software to check their dragsters air resistance and aerodynamics. Before students design their 3D dragster they will be required to sign on to our standards-based curriculum and state-of-the-art engineering tools (WhiteBox Learning) which will guide them through an engaging, realistic product development process capped by a very cool virtual race. Students will also construct 3D rapid prototyping models utilizing our 3D printer. Students will be required to design and use sequential logic to program their own Video Game. Multimedia Fusion 2 software. Students will design Architectural floor plans and then use the software's animation to complete a walk-through of their homes.

Measurable objectives to be attained by students:

Specific objectives for this course are aligned to the National Standards for Technology Literacy, the Pennsylvania Academic Standards for Science and Technology and Engineering Education, and the Pennsylvania Core Standards for Reading and Writing in Science and the Technical Subjects as outlined in the Scope and Sequence for Computer Aided Drafting and Design.

Instructional Strategies:

A well-rounded Technology Education/STEM program requires a wide range of instructional strategies that empower students to develop, refine, and apply technological solutions. Below is a list of suggested strategies for high-quality instruction:

- Instructional components outlined in the *Framework for Teaching* by Charlotte Danielson
- Provide hands-on learning experiences
- Following the engineering design process
- Inquiry and project-based learning focused on problem-solving
- Use of design notebooks

Estimated Instructional Time:

77 minutes per day for alternating A/B block schedule for one school year

Forms of Assessment to Measure Attainment of Course Objectives:

- Curriculum-Based Measures
- Summative Assessments
- Formative Assessments
- Performance-Based Assessment

Resources:**Technology:**

Computer Aided Design software
District approved supplemental technology

Other Resources:

Teacher created resources
District approved supplemental resources