Planned Course for 6-12 Technology Education

Course: Introduction to Engineering Design (PLTW)

Pennsylvania Career Standards:
13.1 Career Awareness and Preparation
13.3 Career Retention and Advancement
13.4 Entrepreneurship

Pennsylvania Standards: PA Science and Technology Standards
3.1 Unifying Themes
3.2 Inquiry and Design
3.6 Technology Education
3.7 Technological Devices
3.8 Science Technology and Human Endeavors

ISTE Standards: Standards for Technology in Education
1 Creativity and Innovation
2 Communication and Collaboration
3 Research and Information Fluency
4 Critical Thinking Problem Solving, and Decision Making

Course Description:
The goal of the 6-12 Technology Education program is to foster the development of essential STEM skills enabling students to understand how technologies are developed and used. Hands-on problem-based activities will allow students to understand and evaluate their effects on other technologies, the environment, and on society itself.

Throughout this course students will dig deep into the design process, using their creativity and applying their knowledge of math and science to hands-on projects like designing a new toy or improving an existing product. Students will create technical drawings and 3D models using CAD and drafting software. While engaging in the problem-solving process they will also be building professional skills such as team collaboration, project management and technical writing. Upon completion of this course, students will be eligible to take the Architectural Computer-Aided Drafting (CAD) and Principles of Engineering courses.

Project Lead The Way (PLTW) Engineering empowers students to step into the role of an engineer, adopt a problem-solving mindset, and make the leap from dreamers to doers. This courses engages students in compelling, real-world challenges that help them become better collaborators and thinkers. Students take from the course in-demand knowledge and skills they will use in high school and for the rest of their lives, on any career path they take.
Specific and measurable objectives directly related to the academic standards to be achieved by students:
Specific objectives for this course are stated as benchmarks to achieve standards in the 9-12 Scope and Sequence.

Content to be used to reach objectives:
In order to offer a comprehensive program students are offered a wide variety of materials at varied levels and interests.

Materials:

| Project Lead the Way Course Resources and Curricular Materials |
| Microsoft Office (Excel, Word, PowerPoint) |
| • 3D solid modeling software - Autodesk Inventor |
| • Dial calipers |
| Production Lab (a variety of hand tools and power equipment) |
| Various Materials (wood, metal, plastic) |
| Workbenches |
| Lockers |
| Dust collection system |

Instructional Activities:
A standards-based Technology program requires that our students develop thinking processes that are self-directed, creative, critical and reflective. Instructional activities include the following best practices:

- Problem Solving
- Cooperative Learning
- Computer Generated Activities
- Whole Group Discussions
- Research

Estimated instructional time to be devoted to achieving objectives:
- Approximately 86 minutes per day, on an alternating block schedule

Procedure for measurement of student progress on the objective:
- Rubrics
- Student Journals
- Completion of Teacher Generated Activities
- Observation
- Projects

An explanation of how student grades will be determined:
Percentage based report cards for Technology are reported at the end of each marking period. Technology grades are determined through a variety of measures. Students are evaluated using a minimum of three formative and a minimum of three summative assessments. Formative assessments include classroom observation, teacher-student conferences, and student work samples. Summative assessments are administered periodically using unit assessments.