PETERS TOWNSHIP HIGH SCHOOL
COURSE SYLLABUS: COMPETITIVE TECHNOLOGY

Course Overview and Essential Skills

The course will allow students to apply their knowledge of technology, math, and science to compete with other students throughout the school, region, and state in problem solving related activities. Activities and competitions sponsored by the Technology Student Association (TSA) and Odyssey of the Mind (OM) will be the foundation of the course. Creativity and ingenuity will be emphasized throughout the course. Many of the challenges introduced during the course will allow students to research and develop technology in an independent mode of study.

Course Textbook and Required Materials

- Ritz, Hadley & Bonebrake. *Exploring Production Systems: Teachers & Student Resources Guide.* Davis Publishing, 1990
- Richars, T. *Stimulating Innovation: A Systems Approach*, St. Martin's Press, 2002
- Devore, P.W. *Technology: An Introduction.* David Publishing, 2004

Course Outline of Material Covered:

Unit or Topic	Concepts/Skills/Resources	Timeframe
CREATIVE PROBLEM SOLVING	• Define a given problem(fact finding) • Establish possible solutions to the problem (brainstorming) • Develop a solution to the problem (solution finding) • Implement the solution to solve the problem (actual building process) • Evaluate the solution as to its effectiveness	**One Month**
EXPLORING INNOVATION AND INVENTION	• Prepare a list of important technological inventions and associate their relevance to today's technology. • Compare and contrast a list of different styles and techniques of innovation and invention. • Apply learned processes to design and build a balsa wood tower, stress test it under the load device.	**One Month**
ENHANCING CREATIVITIY	• Conceptualize a new idea or product that will improve the quality of life in the future. • Propose a definition of what it means to be creative. • Differentiate what the difference is between	**One Month**

	• creativity, development and modification. • Design a list of technological accomplishments, students will describe why each is a manifestation of human creativity. • Design, build, test and analysis an egg car structure.	
PROBLEM SOLVING AND TECHNOLOGY METHODOLOGY	• Develop criteria and gather information needed in developing solutions to technological problems or opportunities. • Evaluate the types of information gathered as a foundation for technological development projects such as the CO2 vehicle activity. • Solve a complex technical problem of designing an aerodynamic vehicle to travel a distance as efficiently as possible.	**One Month**
STRUCTURAL ENGINEERING	• Produce a sketch of different types of buildings. • Select a sketch of a structure and turn it into a detailed drawing using the CAD software. • Generate a list of many natural forces that structures must endure and the design techniques and concepts used to counter act these forces. • Bridge builder design activity.	**One Month**
ENERGY UTILIZATION THROUGHOUT ENGINEERING	• List examples of the various types of energy sources. • Develop a working model of an electromagnet. • Design a working machine to harness energy to power and control a technological system. • Design and build a friction free magnetic levitation vehicle to be tested in class.	**One Month**
AEROSPACE ENGINEERING	• Categorize technological systems that fit into the two modes of aerospace engineering.	**One Month**

	• Create a list of possible products and processes that may shape our future through the application of aerospace engineering. • Explain and describe the process of aerospace exploration. • Research, design, and construct a working model of a rocket to test and analyze.	
TECHNOLOGY STUDENT DESIGN ACTIVITIES	• A project will be chosen from list to complete in preparation for a TSA sponsored event: A rubric for each event will be obtained from the instructor; categories will include projects such as a poster board design, power point presentation, non-working demonstrational model of the structure or a working model of the structure.	**One Month**

Depending on the needs of the class or changes in the school year, the course outline is subject to change.