



Ephrata High School
Course Syllabus
Transportation Engineering



I. Course Description

Transportation Technology

This course is designed to give students experiences related to transportation systems, their various forms, the histories, science and technologies behind them and how they impact our everyday lives.

Activities vary but may include the design, construction and use of a regulation CO₂ powered dragster, magnetic levitation vehicles, hydrostatic rockets, and scale model airfoil designs. Problem-solving experiences in land, sea, and air transportation including aviation systems, aerodynamics, boat hull design and testing with propulsion systems. A great class to fulfill the requirements for the graduation project and for the student interested in engineering. There is a \$10.00 lab fee.

II. Materials & Equipment

Materials used in Transportation Technology will include various, common household items available to almost every one such as: A 2 liter soft drink bottle for a hydrostatic rocket, and other various materials for nosecone, air tube and fin layout design. A 12" section of 2x4 for the construction of their hydrodynamic boat hull design. Practically all other materials and equipment on a regular basis are furnished. The lab fee goes towards the cost(s) associated with the Co₂ car dragster design and its kit.

III. Course Goals & Objectives

Amongst the critical things that a people must deal with is that as a society it must recognize that significant changes are occurring everyday in the levels of technology, along with related businesses and industries, and that new technology plays a key role in competitiveness and economic growth. Equally important is the recognition that there is a direct relation between the creation and the implementation of new technology and the quality of education. The rapidly evolving technology base requires significantly higher levels of competency in technology and the comprehension of those technologies. The ability for an individual to understand the concepts and become fluent in the language of technology tends to humble it and allows ever increasing numbers of individuals to take place in its implementation. Therefore-both the society and the technology-will grow to ever higher levels of proficiency. The ability to compete economically depends on how well we prepare ourselves and our youth to meet the challenge.

1. Students will define Transportation.
2. Students will differentiate between the modes of transportation.
3. Students will give reasons how transportation has affected their lives

4. Students will describe projected future modes of transportation.
5. Students will differentiate the advantages and the disadvantages of transportation systems.
6. Students will describe the various kinds of propulsion systems in transportation.
7. Students will become proficient in the creative design process; A) thumbnail, B) rough layout, C) comprehensive drawings.
8. Students will design and create their own transportation system(s) vehicle models.
9. Understand what is considered past, contemporary, and futuristic means of transportation.
10. Describe how transportation utilizes daily the techniques of the sciences.
11. Understand how brief knowledge of transportation and its systems makes an individual a better consumer.

IV. Course Topics (Summary Outline)

The Creative Design Process...for the non-artist.

Air Transportation

- Basic aerodynamics 101: Airfoils and lift characteristics
- The four forces
- Milestones of Aviation
- Hydrostatic rocketry *project*

Land Transportation

- Oil and its impact on economics
- Co2 car *project*

Water transportation

- Buoyancy vs. displacement
- Hydrodynamic boat hull *project* construction and testing.

V. Assignments & Grading

Design work, drafts and drawings = 20%

Major projects = 45%

Final examination, tests, quizzes, and other classroom activities = 33%

Class Participation = 2%