

East Penn School District
Secondary Curriculum

A Planned Course Statement
for

Power Technology I

Course # 908

Grade(s) 9,10,11,12

Department: Technology Education

Length of Period (mins.) 42

Total Clock Hours: 63

Periods per Cycle: 6

Length of Course (yrs.) 0.5

Type of Offering: required elective

Credit: 0.5

Adopted: 4/23/07

Developed by:

Scott Ramson

Description of Course #908

Course Title: Power Technology I

Description: The Power Technology I elective will challenge students creativity with a variety of problem solving activities while introducing students to the field of Power Technology. Areas of study may include external and internal combustion theory, electric motors and transportation.

Goals:

- To acquire an understanding and appreciation for the multifaceted area of Power Technology.
- To develop an awareness of job opportunities available in the area of Power Technology.
- To develop safe working habits and techniques.

Requirements:

- None

Text:

Teacher created materials

Key to Levels of Achievement (Listed with each learning objective)

Awareness (A):	Students are introduced to concepts, forms, and patterns.
Learning (L):	Students are involved in a sequence of steps and practice activities which involved further development and allow evaluation of process.
Understanding (U):	Students demonstrate ability to apply acquired concepts and skills to individual assignments and projects on an independent level.
Reinforcement (R):	Students maintain and broaden understanding of concepts and skills to accomplish tasks at a greater level of sophistication.

Unit	Num	Objective	Level	Content	Evaluation	Standard
I. Safety	1	Students will learn about personal safety in the Power Technology lab.	R	<ul style="list-style-type: none"> Protective eyewear Proper dress Appropriate footwear Long hair Jewelry 	<ul style="list-style-type: none"> Safety quiz Teacher observation 	3.7
	2	Students will learn about the safe operation of the tools and machines in the Power Technology lab.	R	<ul style="list-style-type: none"> Safety rules specific to each tool and machine used in the lab 	<ul style="list-style-type: none"> Ongoing teacher observation 	3.7
	3	Students will learn how to safely handle hazardous materials.	R	<ul style="list-style-type: none"> Lecture and discussion of MSDS designations and product labels 	<ul style="list-style-type: none"> Ongoing teacher observation 	3.7
	4	Students will learn how to safely handle hazardous and flammable liquids/chemicals.	R	<ul style="list-style-type: none"> Lecture and discussion of MSDS designations and product labels 	<ul style="list-style-type: none"> Ongoing teacher observation 	3.7
	5	Students will learn how to safely work with and around electricity.	R	<ul style="list-style-type: none"> Lecture and discussion pertaining to electric shock, burns, fire and electrocution 	<ul style="list-style-type: none"> Ongoing teacher observation 	3.7
II. External Combustion Theory	6	Students will gain an understanding of external combustion engines.	L	<ul style="list-style-type: none"> Pulsating water engines Reciprocating steam engines Steam turbines 	<ul style="list-style-type: none"> Worksheets Quizzes/tests 	3.6 3.7
	7	Students will design and build a vehicle powered by a P.W.E.	L	<ul style="list-style-type: none"> Project planning Sheet metal layout Sheet metal processing <ul style="list-style-type: none"> Squaring shear Box & pan brake Punches Aviation Shear Spot welding Soldering 	<ul style="list-style-type: none"> Teacher rubric Lab work Teacher observation 	3.6 3.6
	8	Students will design and build an impulse and/or reaction type model steam engine.	L	<ul style="list-style-type: none"> Project planning Sheet metal layout Sheet metal processing <ul style="list-style-type: none"> Squaring shear Box & pan brake Punches Drilling/drill press Aviation shear Soldering 	<ul style="list-style-type: none"> 	3.6 3.7 3.8
III. Internal	9	Students will learn the basic	L	<ul style="list-style-type: none"> Internal engine parts 	<ul style="list-style-type: none"> Quizzes/tests 	3.6

Unit	Num	Objective	Level	Content	Evaluation	Standard
Combustion Theory		operating principles of the 2-stroke cycle engine.		<ul style="list-style-type: none"> Block/cylinder Fuel systems Spark ignition system Lubrication Cooling systems 	<ul style="list-style-type: none"> Teacher rubric 	3.7
	10	Students will learn the basic operating principles of the 4-stroke cycle engine.	L	<ul style="list-style-type: none"> Internal engine parts Block/cylinder Fuel systems Spark ignition system Lubrication Cooling systems 	<ul style="list-style-type: none"> Quizzes/tests Teacher rubric 	3.6 3.7
	11	Students will learn the basic operating principles of the diesel engine.	A	<ul style="list-style-type: none"> Block/cylinder Internal engine parts Fuel systems Compression ignition Lubrication Cooling systems 	<ul style="list-style-type: none"> Quizzes/tests Worksheets 	3.6 3.7 3.8
	12	Students will disassemble, study, evaluate and reassemble a small 4 stroke cycle engine.	L	<ul style="list-style-type: none"> Small engine repair Disassembly, inspection and reassembling Engine block Crank shaft and connecting rod Reading a micrometer Plastic gauge Piston and rings Feeler gauge Theory of carburation and fuel systems Ignition system Lubrication systems Cooling systems Governors Trouble shooting 	<ul style="list-style-type: none"> Quizzes Worksheets Lab work 	3.6 3.7
	13	Students will learn about the basic principles and theories relating to fluid power.		<ul style="list-style-type: none"> Fluid power <ol style="list-style-type: none"> Pneumatics Hydraulics <ul style="list-style-type: none"> Liquids at work-pistons Pumps Control valves 	<ul style="list-style-type: none"> Quizzes Worksheets Lab work 	3.6 3.7
IV. Transportation	14	Students will design, construct, and evaluate the construction of a small electrically powered	U	<ul style="list-style-type: none"> Design factors and limitations Vehicle construction Measuring, planning and 	<ul style="list-style-type: none"> Quizzes/Tests Lab work 	3.6 3.7 3.8

Unit	Num	Objective	Level	Content	Evaluation	Standard
		vehicle.		computer simulation • Soldering and construction • Designing forming and vacuum forming of car bodies • Test of body design in wind tunnel • Electric motor theory • Evaluation and running of vehicle		