Course Description
An introductory course focused on the world of energy technology. Students will gain an understanding of how energy & power technologies impact politics, the environment, society, and the economy. Students will develop a foundation in essential abilities and attitudes that will in turn expand their occupational opportunities in the world of energy & power.

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<th>Core Code</th>
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<tr>
<td>Units of Credit</td>
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<td>Intended Grade Level</td>
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<td>Prerequisite</td>
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<td>Skill Certification Test Number</td>
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<td>License Type</td>
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<td>Required Endorsement(s)</td>
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STAND 1

Students will follow safety practices.

Standard 1
Identify potential safety hazards and follow general laboratory safety practices.
- Assess workplace conditions regarding safety and health.
- Identify potential safety issues and align with relevant safety standards to ensure a safe workplace/jobsite.
- Locate and understand the use of shop safety equipment.
- Select appropriate personal protective equipment.

Standard 2
Use safe work practices.
- Use personal protective equipment according to manufacturer rules and regulations.
- Follow correct procedures when using any hand or power tools.

Standard 3
Complete a basic safety test without errors (100%) before using any tools or shop equipment.

STAND 2

Students will develop an understanding of and be able to select and use energy & power technologies.

Standard 1
In order to understand energy, students should learn that:
- Energy is the capacity to do work.
- Energy can be used to do work, using many processes.
- Energy resources can be renewable, nonrenewable or inexhaustible.
- Energy can be classified into major forms: thermal, radiant, electrical, mechanical, chemical, nuclear, and others.
- Energy cannot be created or destroyed; however, it can be converted from one form to another.

Standard 2
In order to understand power, students should learn that:
- Power is the rate at which energy is converted from one form to another or transferred from one place to another, or the rate at which work is done.
- Power systems are used to drive and provide propulsion to other technological products and systems.
- Much of the energy used in our environment is not used efficiently.
- It is impossible to build an engine to perform work that does not exhaust thermal energy to the surroundings.
• Power systems must have a source of energy, a process, and loads.

**STRAND 3**

**Students will develop an understanding of the cultural, social, economic, and political effects of technology, the effects of technology on the environment, the role of society in the development and use of technology, and the influence of technology on history.**

**Standard 1**

In order to be aware of the history of technology, students should learn that:

- Many inventions and innovations have evolved by using slow and methodical processes of tests and refinements.
- The specialization of function has been at the heart of many technological improvements.
- The design and constructions of structures for service or convenience have evolved from the development of techniques for measurement, controlling systems, and the understanding of special relationships.
- In the past, an invention or innovation was not usually developed with the knowledge of science.

**Standard 2**

In order to realize the impact of society on technology, students should learn that:

- Throughout history, new technologies have resulted from the demands, values, and interests of individuals, businesses, industries, and societies.
- The use of inventions and innovations has led to changes in society and the creation of new needs and wants.
- Social and cultural priorities and values are reflected in technological devices.
- Meeting societal expectations is the driving force behind the acceptance and use of products and systems.

**Standard 3**

In order to understand the effects of technology on the environment, students should learn that:

- The management of waste produced by technological systems is an important societal issue.
- Technologies can be used to repair damage caused by natural disasters and to break down waste from the use of various products and systems.
- Decisions to develop and use technologies often put environmental and economic interests in direct competition with one another.

**STRAND 4**

**Students will identify and understand mechanical system technologies.**

For example:

- internal combustion engine
Standard 1
Identify devices that use mechanical power.

Standard 2
Identify and explain basic components and functions of mechanical power devices.

Standard 3
Design, create, and test a simple mechanical system.

Standard 4
Calculate work and power in a system that converts energy from electrical to mechanical.

**STRAND 5**

Students will identify and understand electrical system technologies.

For example:
- Power distribution
- Electrical generators and motors

Standard 1
Identify devices that use electrical power.

Standard 2
Identify and explain basic components and functions of electrical power devices.

Standard 3
Distinguish between electrical and electronic.

Standard 4
Distinguish between series and parallel circuits.

Standard 5
Test the relationship between voltage, current, and resistance using a digital multi-meter.

**STRAND 6**

Students will identify and understand fluid system technologies.

For example:
- Pneumatic system
- Hydraulic system

Standard 1
Identify devices that use fluid power.

Standard 2
Identify and explain basic components and functions of fluid power devices.
Standard 3
Differentiate between the characteristics of hydraulic and pneumatic systems.

Standard 4
Design, create, and test a hydraulic or pneumatic device.

Standard 5
Calculate values in a fluid power system using Pascal’s Law.

Standard 6
Calculate flow rate, flow velocity, and mechanical advantage in a hydraulic system.

STRAND 7
Students will investigate career opportunities in the energy industry.
- Pneumatic system
- Hydraulic system

Standard 1
Identify occupations related to the energy industry.

Standard 2
Identify different types of occupational training.