



***Department of Teaching & Learning***  
***Parent/Student Course Information***

***Control Technology Program***  
***Power and Transportation Technology***  
***(TE 5450)***  
***Grades 9 - 12***  
***One Credit, One Year***

*Counselors are available to assist parents and students with course selections and career planning. Parents may arrange to meet with the counselor by calling the school's guidance department.*

**COURSE DESCRIPTION**

The courses in engineering and technology provide opportunities for students to acquire skills and knowledge necessary for technological literacy, entry-level careers, and lifelong learning. Students learn Virginia's 21 Workplace Readiness Skills within the content area. Those who are completing a two-year sequence have the opportunity to verify their knowledge of the workplace readiness skills through an industry assessment. Students survey the many broad sources of energy and power used in power and transportation systems. Instruction in this course includes ways that energy is converted to power; power is transmitted and controlled; and power is used through mechanical, fluid and electrical devices. Students explore career opportunities in power and transportation fields design and build products, conduct experiments and repair mechanical devices such as small engines.

**CERTIFICATION**

Students successfully completing the Control Technology Program of Study will be prepared for the NOCTI Industry Credential in Electronics or Small Engines.

**STUDENT ORGANIZATION**

Technology Student Association (TSA) is a co-curricular organization for all students enrolled in engineering and technology courses. Students are encouraged to be active members of their youth organization to develop leadership and teamwork skills and to receive recognition for their participation in local, regional, state and national activities.

**PREREQUISITE**

None

**OPTIONS FOR NEXT COURSE**

Electronics Systems I and II

**REQUIRED STUDENT TEXTBOOK**

*Energy, Power and Transportation Technology*

## COMPETENCIES FOR POWER AND TRANSPORTATION

### **Demonstrating Workplace Readiness Skills: Personal Qualities and People Skills**

- 1 Demonstrate positive work ethic.
- 2 Demonstrate integrity.
- 3 Demonstrate teamwork skills.
- 4 Demonstrate self-representation skills.
- 5 Demonstrate diversity awareness.
- 6 Demonstrate conflict-resolution skills.
- 7 Demonstrate creativity and resourcefulness.

### **Demonstrating Workplace Readiness Skills: Professional Knowledge and Skills**

- 8 Demonstrate effective speaking and listening skills.
- 9 Demonstrate effective reading and writing skills.
- 10 Demonstrate critical-thinking and problem-solving skills.
- 11 Demonstrate healthy behaviors and safety skills.
- 12 Demonstrate an understanding of workplace organizations, systems and climates.
- 13 Demonstrate lifelong-learning skills.
- 14 Demonstrate job-acquisition and advancement skills.
- 15 Demonstrate time-, task- and resource-management skills.
- 16 Demonstrate job-specific mathematics skills.
- 17 Demonstrate customer-service skills.

### **Demonstrating Workplace Readiness Skills: Technology Knowledge and Skills**

- 18 Demonstrate proficiency with technologies common to a specific occupation.
- 19 Demonstrate information technology skills.
- 20 Demonstrate an understanding of Internet use and security issues.
- 21 Demonstrate telecommunications skills.

### **Examining All Aspects of an Industry**

- 22 Examine aspects of planning within an industry/organization.
- 23 Examine aspects of management within an industry/organization.
- 24 Examine aspects of financial responsibility within an industry/organization.
- 25 Examine technical and production skills required of workers within an industry/organization.
- 26 Examine principles of technology that underlie an industry/organization.
- 27 Examine labor issues related to an industry/organization.
- 28 Examine community issues related to an industry/organization.
- 29 Examine health, safety and environmental issues related to an industry/organization.

### **Addressing Elements of Student Life**

- 30 Identify the purposes and goals of the student organization.
- 31 Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.
- 32 Demonstrate leadership skills through participation in student organization activities, such as meetings, programs and projects.
- 33 Identify Internet safety issues and procedures for complying with acceptable use standards.

### **Exploring Power and Transportation**

- 34 Define "power and transportation."
- 35 Select and use instruments to collect quantitative data related to power systems.
- 36 Demonstrate safe work practices while participating in lab activities.
- 37 Introducing Energy, Power and Transportation

- 38 Explain careers related to power and transportation and their educational requirements.
- 39 Describe the development of power and transportation systems throughout the world.
- 40 Research the contributions of individuals and groups related to power and transportation.

### **Exploring Mechanical Power**

- 41 Differentiate among the methods of generating power.
- 42 Describe the relationship between transportation and other technologies.
- 43 Compare and contrast energy sources.
- 44 Research methods of energy conversion (e.g., electrical, fluid, mechanical).

### **Exploring Fluid Power**

- 45 Utilize hydraulic and pneumatic fluid systems to transmit power.
- 46 Demonstrate principles of mechanical systems as they relate to power transmission.
- 47 Utilize electricity to transmit power.
- 48 Work with a design team to design a power transmission system, using a systems approach.
- 49 Make a presentation related to a research project.
- 50 Differentiate between modes of transportation and their effects on society.
- 51 Use technical manuals and Internet resources to research vehicle design and service specifications.
- 52 Evaluate vehicle control systems (i.e., navigation, suspension, steering and braking).
- 53 Evaluate vehicle design considering ergonomics, safety, comfort, efficiency and capacity.
- 54 Using history as a reference, discuss the future of power and transportation systems.
- 55 Design, construct, and test a working model of a transportation vehicle.
- 56 Diagnose and repair vehicle systems.

### **Exploring Power Transmission and Control**

- 57 Identify components of power-transmission systems.
- 58 Measure the performance of power-transmission systems.
- 59 Describe engine construction and principles of operation

### **Exploring Transportation Systems**

- 60 Identify types of transportation systems.
- 61 Differentiate between modes of transportation, including their effects on society.
- 62 Describe components of transportation systems.
- 63 Explain current and basic regulations related to transportation.
- 64 Evaluate the environmental impacts associated with different modes of transportation.

### **Modeling Transportation Systems**

- 65 Research the history of different energies and their use in powering transportation systems.
- 66 Explain how the components of transportation systems interact.
- 67 Evaluate transportation system devices.
- 68 Evaluate transportation control systems.
- 69 Evaluate overall system design.

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For further information please call (757) 263-1070.

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2512 George Mason Drive, Virginia Beach, Virginia, 23456 or the Section 504 Coordinator at the student's school. For students who are eligible or suspected of being eligible for special education or related services under IDEA, please contact the Office of Programs for Exceptional Children at (757) 263-2400, Laskin Road Annex, 1413 Laskin Road, Virginia Beach, Virginia, 23451.

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