



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

***Production Technology Program***  
***Production Systems***  
***(TE 8447)***  
***Grades 10 - 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 plan, design, develop and market products useful in a 21<sup>st</sup> century marketplace. Activities include computer aided manufacturing (CAM), computer numerical control, and robots used in flexible manufacturing systems. Students assess the relationship between production and society as they compose design portfolios, construct production prototypes and apply automation to evaluate their solutions to technological problems.

**CERTIFICATION**

None

**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**

Construction Technology

**OPTIONS FOR NEXT COURSE**

Materials Technology I

**REQUIRED STUDENT TEXTBOOK**

*Manufacturing Processes*

## COMPETENCIES FOR PRODUCTION TECHNOLOGY

### **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 the Nature of Technology**

- 34 Define the role of production in using technology to solve human needs and wants.
- 35 Describe components of the systems model as it relates to production.
- 36 Identify the primary processes used to obtain and produce industrial materials.

- 37 Describe the secondary processes used to convert stock into finished products.
- 38 Describe how advances in STEM fields have influenced production.

### **Examining Technology and Society**

- 39 Explain the relationship between production technology and the economy.
- 40 Appraise the environmental effects of production by-products.
- 41 Explain how society/culture and the development of products influence each other.
- 42 Describe how society's development is impacted by its ability to produce goods.
- 43 Compare types of company ownership.
- 44 Analyzing Design
- 45 Describe the engineering design process.
- 46 Employ different problem-solving techniques.
- 47 Communicate ideas through sketching, technical drawing or CADD.
- 48 Practicing Safety

### **Exploring Fluid Power**

- 49 Implement a safety plan.
- 50 Operate lab equipment according to instructor guidelines.
- 51 Use required PPE (personal protective equipment).
- 52 Maintain safe working practices around production equipment.
- 53 Identify OSHA and its role in production.
- 54 Developing Abilities for a Technological World
- 55 Compose a design portfolio to solve a technological problem.
- 56 Construct models and/or prototypes.
- 57 Perform secondary processing operations on stock to produce products.
- 58 Maintain the components of a production system.
- 59 Complete a post-production evaluation of a production process.
- 60 Predict future trends related to production systems.

### **Examining the Designed World**

- 61 Research materials to determine their mechanical, physical, and chemical properties for a designed product.
- 62 Select materials for use, based on their properties.
- 63 Differentiate among custom, intermittent, flexible, and continuous manufacturing.
- 64 Develop a plan for a facility to produce a specified product.
- 65 Demonstrate automation controls in a production system.
- 66 Describe the management of personnel needed to produce a specific product.
- 67 Implement production personnel systems.
- 68 Research career outlook and training requirements for production employment.

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