



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 22 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 in this course plan, design, build and market products useful in a 21st century marketplace. Activities include basic principles of mass production, flexible manufacturing, tooling computer aided manufacturing (CAM), computer numerical control, and robotics manufacturing systems. Students assess the history of production, relationship between production and society as they compose design portfolios, construct production plans, prototypes and apply automation to evaluate their solutions to technological problems. STEM-related pathways are explored for production and manufacturing related careers.

CERTIFICATION

Students successfully completing the Construction/Production Technology Program of Study will be eligible to receive the online Career Safe OSHA 10 certification for general industry.

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 Abilities

- 1 Demonstrate creativity and innovation.
- 2 Demonstrate critical thinking and problem solving.
- 3 Demonstrate initiative and self-direction.
- 4 Demonstrate integrity.
- 5 Demonstrate work ethic.

Demonstrating Workplace Readiness Skills: Interpersonal Skills

- 6 Demonstrate conflict-resolution skills.
- 7 Demonstrate listening and speaking skills.
- 8 Demonstrate respect for diversity.
- 9 Demonstrate customer service skills.
- 10 Collaborate with team members.

Demonstrating Workplace Readiness Skills: Professional Competencies

- 11 Demonstrate big-picture thinking.
- 12 Demonstrate career- and life-management skills.
- 13 Demonstrate continuous learning and adaptability.
- 14 Manage time and resources.
- 15 Demonstrate information-literacy skills.
- 16 Demonstrate an understanding of information security.
- 17 Maintain working knowledge of current information-technology (IT) systems.
- 18 Demonstrate proficiency with technologies, tools, and machines common to a specific occupation.
- 19 Apply mathematical skills to job-specific tasks.
- 20 Demonstrate professionalism.
- 21 Demonstrate reading and writing skills.
- 22 Demonstrate workplace safety

Examining All Aspects of an Industry

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

Addressing Elements of Student Life

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

Exploring Work-Based Learning

- 35 Identify the types of work-based learning (WBL) opportunities.
- 36 Reflect on lessons learned during the WBL experience.
- 37 Explore career opportunities related to the WBL experience.
- 38 Participate in a WBL experience, when appropriate.

Exploring the Nature of Technology

- 39 Define the role of production in using technology to solve human needs and wants.
- 40 Describe components of the systems model as it relates to production.
- 41 Identify the primary processes used to obtain and produce industrial materials.
- 42 Describe the secondary processes used to convert stock into finished products.
- 43 Describe how advances in science, technology, engineering, and mathematics (STEM) fields have influenced production.

Examining Technology and Society

- 44 Identify the four phases of the industrial revolution, focusing on industrial revolution 4.0.
- 45 Explain the relationship between production technology and the economy.
- 46 Appraise the environmental effects of production by-products.
- 47 Explain how society/culture and the development of products influence one another.
- 48 Describe how society's development is influenced by its ability to produce goods.
- 49 Describe how the social/cultural influences affect the design and quality of produced goods.
- 50 Describe how the economy influences the ability to produce goods.
- 51 Compare types of company ownership.

Analyzing Design

- 52 Describe the engineering design process.
- 53 Employ different problem-solving techniques.
- 54 Communicate ideas through sketching, technical drawing, computer-aided design and drafting (CADD), or storyboarding.

Practicing Safety

- 55 Discuss the importance of a safety plan.
- 56 Implement a safety plan.
- 57 Operate lab equipment according to instructor guidelines.
- 58 Identify job hazards.
- 59 Maintain safe working practices around production equipment.
- 60 Explain OSHA's role in production.

Developing Abilities for a Technological World

- 61 Compose a design portfolio to solve a technological problem.
- 62 Construct models and/or prototypes.
- 63 Perform secondary processing operations on stock to produce products.
- 64 Implement a preventative maintenance program.
- 65 Design a production process for mass producing a product.
- 66 Complete a post-production evaluation of a production process.
- 67 Predict future trends related to production systems.
- 68 Evaluate the importance of market research and customer requirements throughout the design process.

Examining the Designed World

- 69 Research materials to determine their mechanical, physical, and chemical properties for a designed product.

- 70 Select materials for use, based on their properties.
- 71 Differentiate among custom, intermittent, flexible, and continuous manufacturing.
- 72 Develop a plan for a facility to produce a specified product.
- 73 Explore a connected industry.
- 74 Create products using a combination of CADD, computer-aided manufacturing (CAM), computer numerical controlled (CNC), CIM, and flexible manufacturing systems (FMS) processes.

Human Resources

- 75 Describe the management of personnel needed to produce a specific product.
- 76 Implement production personnel systems.
- 77 Research career outlook and training requirements for production employment.

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Produced by the Department of Teaching and Learning.
For further information, please call (757) 263-1070.

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