

## WARREN COUNTY SCHOOL DISTRICT

### PLANNED INSTRUCTION

#### **COURSE DESCRIPTION**

**Course Title:** Technological Design and Systems

**Course Number:** 00749

**Course Prerequisites:** Creating Technology

**Course Description:** Technological Design and Systems is a foundation course in technology for all students in the ninth grade. This exciting, hands-on course provides an overview of the systems areas of bio-related technologies, information, and physical technology. Students, working alone or in groups, will build a foundation for technological literacy by developing, producing, testing and assessing solutions to technological problems. Also, students will analyze the impact of technology on society.

**Suggested Grade Level:** Grade 9

**Length of Course:** One Semester

**Units of Credit:** .5

**PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:**

Technology Education CSPG 65

To find the CSPG information, go to [CSPG](#)

**Certification verified by the WCSD Human Resources Department:** ☒ Yes ☐ No

#### **WCSD STUDENT DATA SYSTEM INFORMATION**

**Course Level:** Academic

**Mark Types:** Check all that apply.

☒ F – Final Average ☒ MP – Marking Period ☒ EXM – Final Exam

**GPA Type:** ☐ GPAEL-GPA Elementary ☐ GPAML-GPA for Middle Level ☐ NHS-National Honor Society

☒ UGPA-Non-Weighted Grade Point Average ☐ GPA-Weighted Grade Point Average

**State Course Code:** Technological Processes 21052; Technology Innovation and Assessment 21054

To find the State Course Code, go to [State Course Code](#), download the Excel file for SCED, click on SCED 6.0 tab, and choose the correct code that corresponds with the course.

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**TEXTBOOKS AND SUPPLEMENTAL MATERIALS**

**Board Approved Textbooks, Software, and Materials:**

**Title:** Technology Engineering  
**Publisher:** Glencoe/McGraw-Hill  
**ISBN #:** 978-0-07-876809-5  
**Copyright Date:** 2008  
**WCSD Board Approval Date:** 2009

**Supplemental Materials:** Pro/E software

**Curriculum Document**

**WCSD Board Approval:**

**Date Finalized:** 4/18/2024  
**Date Approved:** 5/6/2024  
**Implementation Year:** 2024-2025

**SPECIAL EDUCATION, 504, and GIFTED REQUIREMENTS**

The teacher shall make appropriate modifications to instruction and assessment based on a student's Individual Education Plan (IEP), Chapter 15 Section 504 Plan (504), and/or Gifted Individual Education Plan (GIEP).

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**SCOPE AND SEQUENCE OF CONTENT AND CONCEPTS**

**Marking Period 1**

|                          |                 |
|--------------------------|-----------------|
| Safety                   | 2 days          |
| Impacts                  | 3 days          |
| Systems Model            | 1 week          |
| Engineering Principals   | 7 days          |
| Problem Solving          | 5 days          |
| Communication Technology | 2 weeks, 2 days |
| Construction Technology  | 3 weeks, 1 day  |

**Marking Period 2**

|                           |                |
|---------------------------|----------------|
| Construction Technology   | 3 weeks, 1 day |
| Manufacturing Technology  | 3 weeks, 1 day |
| Transportation Technology | 3 weeks, 1 day |
| Bio-related Technology    | 1 week, 3 days |

**Marking Period 3**

|                          |                 |
|--------------------------|-----------------|
| Safety                   | 2 days          |
| Impacts                  | 3 days          |
| Systems Model            | 1 week          |
| Engineering Principals   | 7 days          |
| Problem Solving          | 5 days          |
| Communication Technology | 2 weeks, 2 days |
| Construction Technology  | 3 weeks, 1 day  |

**Marking Period 4**

|                           |                |
|---------------------------|----------------|
| Construction Technology   | 3 weeks, 1 day |
| Manufacturing Technology  | 3 weeks, 1 day |
| Transportation Technology | 3 weeks, 1 day |
| Bio-related Technology    | 1 week, 3 days |

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**Standards/Eligible Content and Skills**

| <b>Performance Indicator</b>  | <b>PA Core Standard and/or Eligible Content</b> | <b>Marking Period Taught</b> |
|---|---|------------------------------|
| Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.  | 3.5.9-12.A                                      | MP1, MP2, MP3, MP4           |
| Critically assess and evaluate a technology that minimizes resource use and resulting waste to achieve a goal.  | 3.5.9-12.B                                      | MP1, MP2, MP3, MP4           |
| Develop a solution to a technological problem that has the least negative environmental and social impact.  | 3.5.9-12.C                                      | MP1, MP2, MP3, MP4           |
| Evaluate a technological innovation that arose from a specific society's unique need or want.   | 3.5.9-12.F                                      | MP1, MP2, MP3, MP4           |
| Evaluate ways that technology and engineering can impact individuals, society, and the environment.   | 3.5.9-12.H                                      | MP1, MP2, MP3, MP4           |
| Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts | 3.5.9-12.I                                      | MP1, MP2, MP3, MP4           |
| Develop a device or system for the marketplace.   | 3.5.9-12.M                                      | MP1, MP2, MP3, MP4           |
| Analyze and use relevant and appropriate design thinking processes to solve technological and engineering problems.   | 3.5.9-12.N                                      | MP1, MP2, MP3, MP4           |
| Apply appropriate design thinking processes to diagnose, adjust, and repair systems to ensure precise, safe, and proper functionality.  | 3.5.9-12.O                                      | MP1, MP2, MP3, MP4           |
| Apply a broad range of design skills to a design thinking process.  | 3.5.9-12.P                                      | MP1, MP2, MP3, MP4           |
| Implement and critique principles, elements, and factors of design.   | 3.5.9-12.Q                                      | MP1, MP2, MP3, MP4           |
| Conduct research to inform intentional inventions and innovations that address specific needs and wants.  | 3.5.9-12.S                                      | MP1, MP2, MP3, MP4           |
| Evaluate and define the purpose of a design.  | 3.5.9-12.U                                      | MP1, MP2, MP3, MP4           |
| Optimize a design by addressing desired qualities within criteria and constraints while considering trade-offs.   | 3.5.9-12.W                                      | MP1, MP2, MP3, MP4           |
| Implement the best possible solution to a design using an explicit process.   | 3.5.9-12.X                                      | MP1, MP2, MP3, MP4           |
| Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.  | 3.5.9-12.Y                                      | MP1, MP2, MP3, MP4           |
| Safely apply an appropriate range of making skills to a design thinking process.  | 3.5.9-12.AA                                     | MP1, MP2, MP3, MP4           |
| Assess how similarities and differences among scientific, technological, engineering, and mathematical knowledge and skills contributed to the design of a product or system.   | 3.5.9-12.BB                                     | MP1, MP2, MP3, MP4           |

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## ASSESSMENTS

**PDE Academic Standards, Assessment Anchors, and Eligible Content:** The teacher must be knowledgeable of the PDE Academic Standards, Assessment Anchors, and Eligible Content and incorporate them regularly into planned instruction.

**Formative Assessments: The teacher will use various assessment methods to conduct in-process evaluations of student learning.**

**Effective formative assessments for this course include:**

- Peer Assessment
- Quizzes
- Teacher Observation
- Pre-assessments of prior knowledge (e.g., Entrance cards or KWL chart)
- Bellringers/Problems of the Day (PODs)
- Discussions
- Exit ticket
- Cooperative learning
- Oral response
- Self-evaluation
- Summarizing

**Summative Assessments: The teacher will use various assessment methods to evaluate student learning at the end of an instructional task, lesson, and/or unit.**

**Effective summative assessments for this course include:**

- Documentation /Portfolio
- Project