**COURSE DESCRIPTION**

**Course** **Title:** Manufacturing Technology

**Course** **Number:** 00750

**Course** **Prerequisites:** Technological Design and Systems

**Course** **Description:** This course provides a broad overview of manufacturing as it relates to technology education and industry. Students will study this system of technology in a broad spectrum of industries/agencies. Students will participate in various laboratory activities as they identify and analyze products, services and processes. They will work individually and in groups to design, test, analyze and evaluate manufacturing processes and products. They will explore marketing and graphic design as it relates to product packaging. Projects beyond course expectations may require a materials fee.

**Suggested Grade** **Level**: Grades 9-12

**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](https://www.education.pa.gov/Educators/Certification/Staffing%20Guidelines/Pages/default.aspx)

**Certification verified by the WCSD Human Resources** **Department:** [x] Yes [ ] No

**WCSD STUDENT DATA SYSTEM INFORMATION**

**Course** **Level:** Academic

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

[x] F – Final Average [x] MP – Marking Period [x] 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**: Engineering and Technology -School Based Enterprise 21993; Technology Innovation and Assessment 21054

To find the State Course Code, go to [State Course Code](https://nces.ed.gov/forum/sced.asp), download the Excel file for *SCED*, click on SCED 6.0 tab, and choose the correct code that corresponds with the course.

**TEXTBOOKS AND SUPPLEMENTAL MATERIALS**

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

**Title:** Click or tap here to enter text.

**Publisher:** Click or tap here to enter text.

**ISBN #:**  Click or tap here to enter text.

**Copyright** **Date:** Click or tap here to enter text.

**WCSD Board Approval** **Date:** Click or tap here to enter text.

**Supplemental Materials:** Pro/E software (available for free if teacher attends training)

**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).

**SCOPE AND SEQUENCE OF CONTENT AND CONCEPTS**

**Marking Period 1**

The World of Manufacturing  1 week

A Safe and Productive Workplace /Machine Safety 2 weeks

Producing Products  4 weeks

Quality Management  2 weeks

**Marking Period 2**

Custom Manufacturing Project  3 weeks

Mass Production Project  6 weeks

**Marking Period 3**

The World of Manufacturing  1 week

A Safe and Productive Workplace /Machine Safety 2 weeks

Producing Products  4 weeks

Quality Management  2 weeks

**Marking Period 4**

Custom Manufacturing Project  3 weeks

Mass Production Project  6 weeks

**Standards/Eligible Content and Skills**

| **Performance Indicator** | **PA Core Standard and/or Eligible Content** | **Marking Period Taught**  |
| --- | --- | --- |
| 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 |
| Recognize and explain how their community and the world around them informs technological development and engineering design. | 3.5.9-12.Z | 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 |
| Analyze how technology transfer occurs when a user applies an existing innovation developed for one function for a different purpose. | 3.5.9-12.CC | MP1, MP2, MP3, MP4 |
| Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system. | 3.5.9-12.DD | MP1, MP2, MP3, MP4 |
| Evaluate how technology enhances opportunities for new products and services through globalization. | 3.5.9-12.FF | MP1, MP2, MP3, MP4 |
| Analyze the stability of a technological system and how it is influenced by all of the components in the system, especially those in the feedback loop. | 3.5.9-12.LL | MP1, MP2, MP3, MP4 |
| Use project management tools, strategies, and processes in planning, organizing, and controlling work. | 3.5.9-12.OO | MP1, MP2, MP3, MP4 |
| Demonstrate the use of conceptual, graphical, virtual, mathematical, and physical modeling to identify conflicting considerations before the entire system is developed and to aid in design decision making. | 3.5.9-12.PP | MP1, MP2, MP3, MP4 |
| Implement quality control as a planned process to ensure that a product, service, or system meets established criteria. | 3.5.9-12.QQ | MP1, MP2, MP3, MP4 |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**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
* Written work
* 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