# Scope & Sequence

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| Course Name: Diversified Manufacturing II **TSDS PEIMS Code:** 13032660 | **Course Credit:** 1.0**Course Requirements:** This course is recommended for students in grades 11-12. **Prerequisites:** Diversified Manufacturing I.**Recommended Prerequisites:** Algebra I. |
| **Course Description:** In Diversified Manufacturing II, students will gain knowledge and skills in the application, design, production, and assessment of products, services, and systems and how those knowledge and skills are applied to manufacturing. The study of manufacturing systems allows students to reinforce, apply, and transfer academic knowledge and skills to a variety of interesting and relevant activities, problems, and settings in a manufacturing setting. Diversified Manufacturing II allows students the opportunity to understand the process of mass production by using a wide variety of materials and manufacturing techniques. Knowledge about career opportunities, requirements, and expectations and the development of skills prepare students for workplace success. |
| **NOTE:** This is a suggested scope and sequence for the course content. This content will work with any textbook or instructional materials. If locally adapted, make sure all TEKS are covered. |
| **Total Number of Periods****Total Number of Minutes****Total Number of Hours** | 175 Periods7,875 Minutes131.25 Hours\* | \*Schedule calculations based on 175/180 calendar days. For 0.5 credit courses, schedule is calculated out of 88/90 days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc. |
| **Unit Number, Title, and Brief Description** | **# of Class Periods\***(assumes 45-minute periods)Total minutes per unit | **TEKS Covered****130.354. (c) Knowledge and Skills** |
| **Unit 1: Industry Regulations, Compliance, and Workplace Safety**This unit will expose students to the important compliance, safety standards, and regulations that are implemented within this industry. Students will learn that such practices are in place to manage resources to minimize losses and liabilities to businesses in the industry. Students will explain and apply safe work practices while performing tasks. Students will determine the role of risk management in the manufacturing industry including, but not limited to, discussions focusing on liability insurance, sanitation, OSHA regulations, MSDS, emergency situations, health code, and security issues. | 20 Periods900 Minutes | 1. The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:(A) demonstrate skills related to health and safety in the workplace as specified by appropriate governmental regulations;3. The student differentiates among the technical concepts that form the knowledge and skills of manufacturing. The student is expected to:(B) adhere to safety regulations for the different types of manufacturing equipment such as cutting, abrasive, boring, turning, shaping, and forming tools7. The student practices safe work habits. The student is expected to:(A) master safety tests based on Occupational Safety and Health Administration regulations;(B) analyze hazardous materials;(C) dispose of hazardous materials; and(D) store all materials safely |
| **Unit 2: Academic Knowledge and Skills for Manufacturing**This unit will include lessons on terminology and skills that are associated with mathematics and science knowledge specifically pertaining to manufacturing. Students will focus on understanding, interpreting, analyzing and knowing how to correctly use units of measure, mathematics concepts, and science principles to solve problems.  | 20 Periods900 Minutes | 2. The student applies academic skills to the requirements of manufacturing. The student is expected to:(B) interpret engineering drawings, charts, diagrams, and welding symbols;(C) select algebraic and geometric principles and formulas required for precision measuring operations 11. The student applies communication, mathematics, and science knowledge and skills to manufacturing activities. The student is expected to:(A) demonstrate communication techniques consistent with industry standards;(B) locate relevant information needed to solve problems;(C) apply mathematics concepts to solve manufacturing problems;(D) analyze science principles used to solve problems; and(E) use appropriate units of measure |
| **Unit 3: Communication Skills**This unit will enhance students’ communication skills, focusing on interpersonal communication skills required within the industry. Students will focus on verbal and nonverbal communication that occurs between employees, employers, customers, and/or clients within the manufacturing industry.  | 10 Periods450 Minutes | 2. The student applies academic skills to the requirements of manufacturing. The student is expected to:(A) demonstrate effective oral and written communication skills with individuals from varied cultures, including fellow workers, management, and customers11. The student applies communication, mathematics, and science knowledge and skills to manufacturing activities. The student is expected to:(A) demonstrate communication techniques consistent with industry standards |
| **Unit 4: Manufacturing Technology**During this unit, students will learn about the types of technology required to perform workplace tasks for the lodging industry. Students will understand how computerized systems are integral to businesses’ effectiveness and completing workplace tasks with accuracy and efficiency. Students will identify and describe trends in the use of technology in the manufacturing industry, including the use of CNC and CAM systems. | 20 Periods900 Minutes | 4. The student learns skills in production and programming of computer numerical control (CNC) operations. The student is expected to:(A) develop a CNC program using a computer-aided manufacturing (CAM) program; and(B) execute the CNC program to machine a product or run a simulation of the program5. The student investigates emerging and innovative applications of technology in manufacturing. The student is expected to:(A) research innovative technologies in manufacturing |
| **Unit 5: Commercial Equipment**During this unit students will acquire and apply basic knowledge of using and maintaining professional manufacturing equipment. Students will identify materials and resources used in manufacturing. Students will be able to demonstrate the operation of professional equipment to include, but not limited to, cutting, abrasive, boring, turning, shaping, and forming tools. Students will understand, interpret, analyze and know how to correctly measure. | 20 Periods900 Minutes | 3. The student differentiates among the technical concepts that form the knowledge and skills of manufacturing. The student is expected to:(A) use tools and equipment commonly employed in manufacturing in a safe manner;(B) adhere to safety regulations for the different types of manufacturing equipment such as cutting, abrasive, boring, turning, shaping, and forming tools;(C) execute procedures using the different types of manufacturing equipment such as cutting, abrasive, boring, turning, shaping, and forming tools;(D) perform varied measurements, including precision measurements;(E) design and develop the jigs and fixtures for a simple four (or fewer) part product; and(F) participate in the production run off of the product |
| **Unit 6: Designing and Manufacturing Individual Projects**Students will perform a pre-planned manufacturing activity applying correct safety procedures, appropriate use of materials, and processing operations. Students will decide on an appropriate production technique for the specified product. Students will evaluate the appropriateness of the chosen technique and make necessary changes to maximize efficiency.  | 20 Periods900 Minutes | 5. The student investigates emerging and innovative applications of technology in manufacturing. The student is expected to:(B) experiment with different manufacturing materials such as plastic, composites, fiberglass, stone, and wood6. The student manufactures products or systems using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:(A) analyze engineering properties such as the processes needed to complete a project;(B) analyze the processes needed to complete a project such as initiate, plan, execute, monitor and control, and close; and(C) use a variety of tools and equipment to produce a product to specification |
| **Unit 7: Manufacturing and Mass Production**Students will learn to describe the processes of input, processing, output, and feedback that comprise the universal systems model. Students will describe assembling and finishing processes in manufacturing. Students will perform a pre-planned manufacturing activity applying correct safety procedures, appropriate use of materials, and processing operations. Students determine the cost of production, develop a breakeven analysis and develop a cost analysis report.  | 30 Periods1,350 Minutes | 2. The student applies academic skills to the requirements of manufacturing. The student is expected to:(D) develop the information needed to mass produce a simple project such as flow charts, schedules, equipment lists, and material lists; and(E) explore the use of jigs and fixtures in mass production 8. The student participates in the manufacturing of a mass-produced product. The student is expected to:(A) participate in the manufacturing of products; and(B) develop a method to check and maintain quality control throughout the manufacturing process9. The student identifies the factors that influence the cost of an item. The student is expected to:(A) calculate costs associated with production of a mass-produced product; and(B) re-examine the manufacturing process to maximize efficiency and minimize costs without compromising the integrity and marketability of the product |
| **Unit 8: Marketing & Customer Relations**This unit will enhance students’ communication skills, focusing on learning the aspects of quality customer service. Students will be able to demonstrate an understanding of customer relations including handling of difficult situations. Additionally, students will learn about the analysis of customer feedback to lead to improved performance. | 15 Periods675 Minutes | 10. The student describes the relationship between manufacturing and marketing. The student is expected to:(A) prepare a marketing plan for a product;(B) analyze the effect of customer satisfaction on the image of a product; and(C) analyze how customer demands influence the design of an object |
| **Unit 9: Employability Skills**This unit explores the professional standards and employability skills required by business and industry. Students will grow to understand that responsibility, time management, organization, positive attitude, and good character have a large impact on employability and job retention.  | 20 Periods900 Minutes | 1. The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:(A) demonstrate skills related to health and safety in the workplace as specified by appropriate governmental regulations;(B) demonstrate the standards required in the workplace such as interviewing skills, flexibility, willingness to learn new skills and acquire knowledge, self-discipline, self-worth, positive attitude, and integrity in a work situation;(C) use teamwork to solve problems;(D) identify employers' work expectations;(E) use time-management techniques to develop work schedules;(F) explore advanced knowledge and skills required for postsecondary education; and(G) identify employers' expectations to foster positive customer satisfaction |