CTE
Career & Technical Education

Precision Machining 5 & 6
Dual enrollment: Pima MAC 100
Scope & Sequence: Year 3

Semester 1		Semester 2	
Quarter 1	**Quarter 2**	**Quarter 3**	**Quarter 4**
Standards: 2.0 Professional Standards:4.0, 8.0, A, C, D, E <u>Unit 1</u> **Shop Safety and Shop Etiquette** • Identify and practice use of appropriate Personal Protective Equipment (PPE) for the machine shop environment. • Explain Purpose of Occupational Safety and Health Administration (OSHA). • Interpret Material Safety Data Sheet information (MSDS). • Best practices and procedures. Standards: 3.0, 4.2, 10 Professional Standards: 3.0, 4.0 <u>Unit 2</u> **Trigonometry in CNC Machining** • Introduction to G and M codes. • Identify importance of programming syntax. • Identify Materials and methods • Solve basic algebra equations. • Identify standards of material classification. Standards: 5.1, 5.2 Professional Standards: 3.0, 4.0 <u>Unit 3</u> **Introduction to CAD CAM** • Using available software to begin.	Standards: 3.1, 3.2, 4.4, 5.4, 8.0, 12.0 Professional Standards: 3.0, 4.0 <u>Unit 4</u> **Intermediate CNC Milling Operations** • Write G code programs and check G codes on. • Perform setup of CNC Milling machines. Standards: 5.1, 5.2 Professional Standards: 3.0, 4.0 <u>Unit 5</u> **Intermediate Solidworks Modeling: Milling** • Create models and drawings of part(s) for machining operations. • Using Geometric Dimensioning and Tolerances (GD&T) to define tolerances of part. • Create and follow a process plan.	Standards: 3.1, 3.2, 4.4, 5.4, 7.0, 11.0 Professional Standards: 3.0, 4.0 <u>Unit 6</u> **Intermediate CNC Turning Operations** • Identify parts of CNC turning machines. • Describe the X- and Z-axes used for turning. • Apply turning programming codes. • Apply CNC-specific turning operations and canned cycles. • Perform basic set-up procedures (e.g., workholding, partholding, offsets, toolholders). • Demonstrate program prove-out procedures. Standards: 5.1, 5.2 Professional Standards: 3.0, 4.0 <u>Unit 7</u> **Intermediate Solidworks Modeling: Turning** • Using Geometric Dimensioning and Tolerances in drawings. • Create layouts on parts. • Create and follow a process plan. ***Technical Skills Assessment*** ***Industry Certification Testing***	Standards: 3.0, 5.0, 7.0 8.0, 11.0, 12.0 Professional Standards: 3.0, 4.0 <u>Unit 8</u> **3rd Year Capstone Project** • Creation of 3d model, drawing, process plan, setup sheet and inspection sheets for parts. • Incorporate Lathe and Mill operations into a part. • Quality control of machined parts. • Perform precision grinding of final parts to specified tolerances. ***NIMS Certification Testing*** CNC Mill Operations CNC Lathe Operations

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51% of the entire program will be conducted in a lab setting. The lab consists of hand-on learning projects and experiences where student will practice the necessary skills to complete the current unit study.