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| **Erie High School** | **Machine Trades Curriculum Map****CIP Code #48.0501** | **Industry Standards****OSHA** |
| **1st Year**  | **1st Quarter**Orientation of StudentsIntro and Understanding Importance of Shop Safety & Personal Protective Equipment (PPE)Intro to Safety Data Sheets (SDS)Intro to National Institute of Metalworking Skills (NIMS)Intro toOccupational Safety and Health Administration (OSHA)*CareerSafe OSHA 10 Hour Manufacturing* *certification* online training (www.careersafeonline.com)Math: Math Fundamentals, Fractions & Decimals | **2nd Quarter**NIMS Intro to Machining (Section 1)Careers in ManufacturingNIMS Measurement, Materials & Safety (MM&S) (Section 2)Understanding and Use of Rulers, Calipers and Other Measuring Equipment, Metallurgy and Inspection Process Intro to Basic Blueprint Reading Basic Inspection Procedures*NIMS Certification Test* (*written only)* *to* *achieve Level 1: MM&S Certificate*Math: Linear Measuring Methods | **3rd Quarter**Use of Power SawsIntro to Basic Blueprint ReadingIntro to NIMS CNC Lathe OperationsSafe Operations of CNC Lathes Knowledge of Control PanelIdentification and Proper Use of Lathe Tooling Lathe Process and Planning Procedures*NIMS Credential Achievement Record (CAR) Activities check-list will earn Level 1: CNC Lathe Operator Skills Credential Program Certificate*Math: Geometry--Lines, Angles, Triangles, Circles  | **4th Quarter**Use of Power SawsIntro to Basic 2D Mill Blueprint ReadingIntro to NIMS CNC Mill OperationsSafe operations of CNC Mills Knowledge of Control PanelIdentification and Proper Use of Mill Tooling Milling Process and Planning Procedures*NIMS Credential Achievement Record (CAR) Activities check-list will earn* *Level 1: CNC Mill Operator Skills Credential Program Certificate*Math: Applied Basic Math for Blueprint Calculations, Cartesian Coordinate system |
| **2nd Year**  | **1st Quarter**Shop SafetyUnderstanding Decimals and FractionsReading a RulerUnderstanding Basic Blueprint ReadingUnderstanding Layout Tools and How to Employ ThemUnderstanding Basic Inspection Tools and How to Employ ThemSafety on Horizontal Band SawUnderstanding and Operating the Horizontal Band SawSet Up Band Saw and Cut Work Piece*NIMS Project Layout* | **2nd Quarter**Safety on Manual Vertical Milling MachineUnderstanding and Learning How to Operate the Vertical Milling MachineTram the Head of Vertical Milling MachineMount and Indicate Vise on Vertical Milling MachineDifferentiate Between Climb Milling and Conventional MillingSquare Block on a Vertical Milling MachineLearn How to Check the Block for Square *NIMS Project Bench Work* | **3rd Quarter**Safety on Manual LatheUnderstanding and Learning to Operate the LatheUnderstanding and Indicating the Run Out on a Three-Jaw ChuckSet Tool HeightFace End of Work PieceTurning Outside Diameters on the LatheCenter Drilling on the LatheDrilling a Hole on the LatheSafety on the Pedestal GrinderUnderstanding of and Learning How to Sharpen Drills and Lathe Tools on the Grinder | **4th Quarter**Appling Safety on the Drill Press and Milling MachineUnderstanding the Drill PressLearning About Hole Making on Drill Press and Milling MachineDrill a Hole on the Drill PressCounter Bore and Spot Face on Drill PressLearn How to Edge Find and Locate the Center of a Hole on the Milling MachineDrill a Hole on the Milling Machine*NIMS Project Drill Press*  |

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| **Erie High School****Erie High School Logo** | **Machine Trades Curriculum Map****CIP Code #48.0501** | **Industry Standards****OSHA** |
| **3rd Year**  | **1st Quarter**Shop Safety Machine Maintenance on the Milling Machine Identify Metals ClassificationApply Safety Procedures on the Milling MachineReam a Hole on the Milling MachineSpot Face and Counter Bore on Milling MachineCut an Angle on the Milling MachineMill a Keyway on the Milling MachineIntroduction to Precision Inspection ToolsUnderstanding of Sine Plates and Sine BarsUse Gage Blocks and Sine Plate to Check Milled AngleLocate Position and Cut Slot on Vertical Milling Machine*NIMS Project Manual Mill* | **2nd Quarter**Apply Surface Grinder Safety ProcedureUnderstanding Advance Blue Print ReadingUnderstand and Operate a Surface GrinderDress Grinding WheelGrind Magnet Flat on the GrinderGrind Two Sides Parallel Grind a SlotGrind a KeywayGrind a Block SquareGrind Precision AngleApply Advanced Measuring Techniques*NIMS Project Surface Grinder* | **3rd Quarter** Safety on the Engine LatheTurn Part Between CentersCut Inside DiameterUse Grooving Tool to Turn Groove in the LatheCut Threads on Engine LatheUse a Die to Cut Threads in the LatheUse Go/No-Go Gage to Check ThreadsTap a Hole in the Lathe-Knurl on the Engine Lathe*NIMS Project Turning Between Centers**NIMS Project Chucking in the Lathe* | **4th Quarter**Advance Machining Methods on the MillMake 123 blocks and a Tool Maker’s Vise on the MillAdvance Surface GrindingPrecision Grind the 123 blocks and the Tool Maker’s vise*NIMS Project Surface Grinder* |
| **4th Year**  | **1st Quarter**Safe Operations of CNC Lathes Knowledge of Control PanelIdentification and Proper Use of Lathe ToolingLathe Process and Planning ProceduresProgramming- Using G & M Code *From NIMS Blueprint Write a Program (Multi-Tool/Cycle) Using G & M Code for NIMS Project*Prove Out & Edit Program on SimulatorSetting Work & Tool Offsets (Manually) *CNC Turning: NIMS Certification Test (written)*Math: Trigonometry- Intro to the Pythagorean Theorem  | **2nd Quarter**Develop a Process to Setup the Machine to Make NIMS Assignment Mount Tooling NeededSetting Offsets (Work & Tool) Manually Make Necessary Offsets or Changes to Make Project for Inspection *NIMS (Project): Use Program to Properly Setup Machine for Safe Operations to Manufacture Part Within Tolerance Given Specification & Achieve* *Level 1: CNC Turning Certificate* Setting Offsets Using Work & Tool Probes and Machine Generated Macro (MGM) Math: Trigonometry---solving angles | **3rd Quarter**Safe Operations of CNC Mill Knowledge of Control PanelIdentification and Proper Use of Mill ToolingProcess and Planning ProceduresProgramming Using G & M Code *Write a CNC Mill Program (Multi-Tool) for NIMS Project*Prove Out & Edit Program on SimulatorSetting Work & Tool Offsets (Manually) *CNC Mill: NIMS Certification Test (written)*Math: Trigonometry- Sine, Cosine, Tangents | **4th Quarter**Develop a Process to Setup the Machine to Make NIMS Assignment Mount Tooling Needed in Holders Setting Offsets (Work & Tool) Manually Make Necessary Offsets or Changes to Make Project for Inspection*NIMS (project): Use Program to Properly Setup Machine for Safe Operations to Manufacture Part Within Tolerance Given Specification & Achieve* *Level 1: CNC Milling Certificate*Setting Offsets Using Work & Tool Probes and Machine Generated Macro (MGM) Math: Trigonometry Sine Bar Applications |