

CURRICULUM MAPPING TEMPLATE

Program: Machine Tool Technology/Machinist (2013) CIP CODE: 48.0501

| Segment | CTE Segments/Performance Elements | CTE Concepts | Math Concepts | Common Core Math Standards Middle School | Common Core Math Standards High School |
|---------|---|------------------------------------|----------------------------|--|--|
| 1 | Safety | | | | |
| | <p>Technical Standards E. General Maintenance</p> <p>1. Keep the duty station clean and safe for work.</p> <p>F. Industrial Safety and Environmental Protection</p> <p>1. Carry out assigned responsibilities while adhering to safe practices in accordance with OSHA requirements and guidelines.</p> <p>2. Handle and store hazardous materials as assigned while adhering to safe practices in accordance with OSHA and EPA requirements and guidelines.</p> | 1.E.1. Mix coolants and degreasers | Ratios and proportions (1) | 6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 7.EE.3 | G.MG.3 |
| | <p>Pathway B. Manage safe and healthy production working conditions and environmental risks.</p> <p>1. Perform environmental and safety inspections following local, federal, and company regulations.</p> <p>2. Perform emergency drills as part of an emergency response team.</p> <p>3. Identify unsafe conditions according to safety standards.</p> <p>4. Implement corrective actions to follow safety protocols.</p> <p>5. Monitor daily housekeeping activities.</p> | | | | |

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| | <p>E. Demonstrate the safe use of manufacturing equipment.</p> <p>1. Train others to use equipment following safe production practices.</p> <p>2. Recommend processes and procedures to support safety and effectiveness in the work environment.</p> | | | | |
| | <p>Manufacturing</p> <p>C. Comply with federal, state and local regulations to ensure worker safety and health and environmental work practices.</p> <p>1. Assess workplace conditions according to specified safety and health requirements.</p> <p>2. Following appropriate safety procedures, demonstrate methods to correct common hazards.</p> <p>3. Demonstrate safe workplace practices that promote personal and group health.</p> <p>E. Describe government policies and industry standards that apply to manufacturing.</p> <p>3. Demonstrate workplace activities that comply with safety, health, and environmental policies and procedures.</p> <p>4. Demonstrate knowledge of rules and laws designed to promote safety and health and their rationale.</p> | | | | |
| 2 | Metal Working Theory/Materials | | | | |
| | <p>Technical Standards</p> <p>A. Job Process Planning</p> <p>1. Formulate a set of strategies to manufacture a part and fill out an operation sheet reflecting the chosen strategies including the required speeds and feeds.</p> <p>J. Decision making and problem solving</p> <p>1. Can apply decision making rules.</p> <p>2. Demonstrate basic problem solving.</p> | <p>2.A.1. Turners Cube, return rate, amount of scrap metal, rpm, feed rate, Handbook</p> <p>2.J.1-2 consequences of rate being too fast or too slow, analyze chip formation</p> | <p>Solving linear equations, rates, ratios, Reading for information, problem solving (1)</p> <p>Problem solving, reexamine math (1)</p> | <p>6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 6.EE.6; 6.EE.7; 6.EE.8; 6.EE.9; 7.EE.1; 7.EE.2; 7.EE.3; 7.EE.4; 8.EE.7; 8.EE.8; 8.F.4; 6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5;</p> | <p>G.MG.3; A.CED.1; A.CED.2; A.CED.3; A.CED.4; A.REI.3; A.REI.4; A.REI.10; F.LE.1; F.LE.2; F.LE.5; F.IF.5; A.SSE.1; F.BF.1; N.Q.1; N.Q.2; N.Q.3; S.ID.6; S.IC.1; S.IC.2;</p> |

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| | <p>M. Metalworking Theory</p> <p>3. Recognizes common materials and their principal properties relevant to machining tasks.</p> <p>4. Recognizes and understands the function of machine tools.</p> | <p>2.M.3. Properties of materials affects speed and feed</p> <p>2.M.4. Properties of materials affects the machine tools used</p> | <p>2.M.3. Linear equations and chart reading (1)</p> <p>Evaluate and understand linear relationships (1)</p> | <p>7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4</p> | <p>S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1</p> |
| | <p>Pathway</p> <p>D. Coordinate work teams when producing products to enhance production process and performance.</p> <p>5. Communicate material specifications, production requirements, product specifications, and delivery issues in a timely and accurate manner.</p> | <p>2.D.5 consideration and planning of the following: lead time of product, cost of part, % waste, how many machines it will take to produce order, tolerances +/- 1/10 is more expensive than +/- .001, plug and play</p> | <p>Whole #, fractions, decimals, percents, linear, time, circles, cylinders, charts and tables (3)</p> | <p>6.RP.2; 6.RP.3; 7.EE.2; 7.EE.3; 6.NS.1; 6.EE.2; 7.NS.1; 7.NS.2; 7.NS.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.RP.1; 6.G.1; 7.G.4; 7.G.6; 8.F.3; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4</p> | <p>A.APR.1; A.APR.7; N.RN.3; N.Q.1; G.CO.5; G.GMD.1; G.MG.1; G.GMD.2; G.GMD.3; S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1</p> |
| | <p>Cluster</p> <p>F. Demonstrate workplace knowledge and skills common to manufacturing.</p> <p>2. Summarize how materials can be processed using tools and machines.</p> | | | | |
| 3 | Inspection and Measurement | | | | |
| | <p>Technical Standards</p> <p>C. Quality Control and Inspection</p> <p>1. Develop an inspection plan and inspect simple parts using precision tools and techniques.</p> <p>2. Follow a sampling plan and inspect the samples for the required data.</p> <p>I. Mathematics</p> <p>1. Perform addition, subtraction, multiplication, and division of whole numbers without a calculator, and performs calculation of fractions and decimals, as well as conversion to metric measurement with or</p> | <p>3.C.1-2 Use of common inspection tools</p> <p>3.I.1-5 Planning, production and inspection</p> | <p>Whole #'s, decimals (1) solving linear equation, trig ratios (2),</p> <p>3.I.1-5 See standards</p> | <p>6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.EE.6; 6.EE.7; 6.EE.8; 6.EE.9; 7.EE.1; 7.EE.2; 7.EE.3; 7.EE.4; 8.EE.7; 8.EE.8; 8.F.4</p> | <p>A.APR.1; A.APR.7; N.RN.3; N.Q.1; A.CED.1; A.CED.2; A.CED.3; A.CED.4; A.REI.3; A.REI.4; A.REI.10; F.LE.1; F.LE.2; F.LE.5; F.IF.5; A.SSE.1; F.BF.1; S.ID.6; G.SRT.8; G.SRT.10; F.TF.1; F.TF.3</p> |

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| | <p>without a calculator.</p> <p>2. Demonstrate basic geometry.</p> <p>3. Use standard formulas and arithmetic operations to make required calculations with or without a calculator (Algebra).</p> <p>4. Use standard formulas an arithmetic operations to make required calculations with or without a calculator solving for unknowns in right triangles (Trigonometry).</p> <p>5. Use standard formulas and arithmetic operations to calculate means, medians, modes, and ranges with or without a calculator (Statistics).</p> <p>L. Measurement</p> <p>1. Recognizes and applies basic measuring instruments.</p> <p>2. Recognizes and applies precision measuring instruments.</p> <p>3. Recognizes and applies precision tools and instruments for surface plate work.</p> <p>4. Convert all measurements to metrics.</p> | 3.L.1-5 Measurement and inspection | Whole #'s, decimals, rule, conversions (1) | 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 7.EE.3 | A.APR.1; A.APR.7; N.RN.3; N.Q.1 |
| | <p>Production</p> <p>C. Make continuous improvement recommendations based on results of production process audits and inspections.</p> <p>2. Check calibration of gauges and other data collection equipment.</p> <p>4. Inspect materials at all stages of process to determine quality or condition.</p> | 3.C.2 & 4 Calibration and Inspection | Whole #'s, decimals, problem solving (1) | 7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3 | A.APR.1; A.APR.7; N.RN.3; N.Q.1; N.Q.2; N.Q.3; S.ID.6 |
| | <p>Manufacturing</p> <p>F. Demonstrate workplace knowledge and skills common to manufacturing.</p> <p>5. Explain the processes of inspection and quality control used in manufacturing.</p> | 3.F.5 Quality Control | Inputting data and analyzing Histograms and charts (1) | 6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4 | S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1 |

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| 4 | Print Reading and GD & T | | | | |
| | Technical Standards K. Engineering drawings and sketches 1. Interprets orthographic blueprints. 2. Interprets GDT orthographic prints. 3. Identify common symbols, the use of datum references and tolerances use in GD&T. | 4.K.1-3 Blueprint reading | Whole #'s, decimals, fractions, special relationships, problem solving (1) | 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 7.EE.3; 6.NS.1; 6.EE.2 | A.APR.1; A.APR.7; N.RN.3; N.Q.1; N.Q.2; N.Q.3; S.ID.6 |
| 5 | Benchwork | | | | |
| | Technical Standards B. Job Execution 1. Manual Operations: Benchwork - Develop a process plan for a part requiring milling, drilling, turning, or grinding. 2. Manual Operations: Layout - Layout the location of hole centers and surfaces within an accuracy of +/- .015. | 5.B.1 Planning for Manual Operations 5.B.1 Layout | Whole #'s, decimals, fractions, linear equations, Cartesian coordinate system (1) Whole #'s, decimals, fractions, linear equations, Cartesian coordinate system, diameter, radius, locating center of circle, trig ratios (1) | 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.NS.1; 6.EE.2; 6.EE.6; 6.EE.7; 6.EE.8; 6.EE.9; 7.EE.1; 7.EE.2; 7.EE.3; 7.EE.4; 8.EE.7; 8.EE.8; 8.F.4; 7.G.5 | A.APR.1; A.APR.7; N.RN.3; N.Q.1; A.CED.1; A.CED.2; A.CED.3; A.CED.4; A.REI.3; A.REI.4; A.REI.10; F.LE.1; F.LE.2; F.LE.5; F.IF.5; A.SSE.1; F.BF.1; S.ID.6; G.CO.9; G.CO.12; G.CO.13; G.SRT.8; G.SRT.10; F.TF.1; F.TF.3 |
| | Manufacturing F. Demonstrate workplace knowledge and skills common to manufacturing. 1. Demonstrate the planning and layout processes (e.g., designing, print reading, measuring) used in manufacturing. | 5.F.1 physical layout of the part | Whole #'s, decimals, fractions, linear equations, Cartesian coordinate system, diameter, radius, locating center of circle, trig ratios (1) | 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.NS.1; 6.EE.2; 6.EE.6; 6.EE.7; 6.EE.8; 6.EE.9; 7.EE.1; 7.EE.2; 7.EE.3; 7.EE.4; 8.EE.7; 8.EE.8; 8.F.4; 7.G.5 | A.APR.1; A.APR.7; N.RN.3; N.Q.1; A.CED.1; A.CED.2; A.CED.3; A.CED.4; A.REI.3; A.REI.4; A.REI.10; F.LE.1; F.LE.2; F.LE.5; F.IF.5; A.SSE.1; F.BF.1; S.ID.6; G.CO.9; G.CO.12; G.CO.13; G.SRT.8; G.SRT.10; F.TF.1; F.TF.3 |

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| 6 | Occupational Skills/Work Habits | | | | |
| | <p>Technical Standards</p> <p>G. Career Management and Employment Relations</p> <ol style="list-style-type: none"> 1. Develop career plan. 2. Develop resume. 3. Complete job application. 4. Demonstrate interviewing skills. 5. Demonstrate appropriate interpersonal skills. 6. Identify and explain the major departments or functions in a metalworking company and how they affect production units. 7. Explain the employment rights and responsibilities in metalworking companies. <p>H. Written and Oral Communication</p> <ol style="list-style-type: none"> 2. Communicate technical and non-technical information in writing. 3. Communicate technical and non-technical information through oral communication. 4. Use active listening skills in comprehending simple technical and non-technical verbal information. | 6.G.1 & 5 personal financial budgeting | Whole #'s, problem solving | 6.NS.2; 6.NS.3; 7.NS.1; 7.EE.3 | A.APR.1; A.APR.7; N.RN.3; N.Q.1; N.Q.2; N.Q.3; S.ID.6 |
| | <p>Production</p> <p>A. Diagnose production process problems and take corrective action to meet production quality standards.</p> <ol style="list-style-type: none"> 1. Communicate quality problems following the appropriate reporting process. <p>D. Coordinate work teams when producing products to enhance production process and performance.</p> <ol style="list-style-type: none"> 3. Make job assignments to avail the use of the best personnel in key assignments. | 6.A.1 consequences of rate being too fast or too slow, analyze chip formation | Problem solving, re-examine math | | N.Q.1; N.Q.2; N.Q.3; S.ID.6 |

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| | 4. Coordinate work flow with team members and other work groups. | | | | |
| | <p>Career Ready Practices</p> <p>A. Career Ready Skills</p> <p>1. Act as a responsible and contributing citizen and employee.</p> <p>2. Apply appropriate academic and technical skills.</p> <p>3. Attend to personal health and financial well-being.</p> <p>4. Communicate clearly, effectively and with reason.</p> <p>5. Consider the environmental, social and economic impacts of decisions.</p> <p>8. Model integrity, ethical leadership and effective management.</p> <p>9. Plan education and career path aligned to personal goals.</p> | 6.A.9 Personal financial budgeting | Whole #'s, problem solving | 6.NS.2; 6.NS.3; 7.NS.1; 7.EE.3 | A.APR.1; A.APR.7; N.RN.3; N.Q.1; N.Q.2; N.Q.3; S.ID.6 |
| 7 | Saws, Drills, and Power Tools | | | | |
| | <p>Technical Standards</p> <p>A. Job Process Planning</p> <p>2. Identify all major components and functions of the machine tools, and all major hand tools, measuring tools, tools and fixtures, work materials and provide the rationale for the speeds and feeds selected.</p> <p>B. Job Execution</p> | 7.B.7 Drill press operation, | Whole #'s, decimals, fractions, | 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.NS.1; 6.EE.2; 6.EE.6; 6.EE.7; 6.EE.8; 6.EE.9; 7.EE.1; 7.EE.2; 7.EE.3; 7.EE.4; 8.EE.7; | A.APR.1; A.APR.7; N.RN.3; N.Q.1; A.CED.1; A.CED.2; A.CED.3; A.CED.4; A.REI.3; A.REI.4; A.REI.10; F.LE.1; F.LE.2; F.LE.5; F.IF.5; |

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| | 7. Drill Press - Set up and operate drill press. M. Metalworking Theory 1. Explain cutting theory. | running correct speeds and feeds | linear equations, Cartesian coordinate system, diameter, radius, locating center of circle, (1) Trig ratios (3) | 8.EE.8; 8.F.4; 7.G.5 | A.SSE.1; F.BF.1; S.ID.6; G.CO.9; G.CO.12; G.CO.13; G.SRT.8; G.SRT.10; F.TF.1; F.TF.3 |
| 8 | Maintenance and Set Up | | | | |
| | Technical Standards E. General Maintenance 2. Conduct preventative maintenance on machine tools. 3. Conduct tooling maintenance. H. Written and Oral Communication 1. Locate, understand, and interpret written technical and non-technical information in documents commonly found in the metalworking industry. M. Metalworking Theory 2. Recognizes a wide variety of cutting tools, tool holding devices and work holding devices as well as the appropriate application of them. | 8.E.2 Coolants 8.E.3 sharpening drill bits | Ratios and proportions Angular measurements | 6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 7.EE.3; 7.G.5 | G.MG.3; G.CO.9; G.CO.12; G.CO.13 |
| | Production E. Demonstrate the safe use of manufacturing equipment. 3. Maintain, install, and repair equipment following required safety and health requirements. 4. Monitor equipment and operator according to workplace safety and compliance with both company and national regulations. 5. Perform preventive maintenance and routine repair by contacting appropriate people and securing needed supplies. | | | | |
| 9 | Mill I/Lathe I | | | | |
| | Technical Standards | 9.B.3-4 Turning Operations | Whole #'s, decimals, fractions, | | |

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| | <p>B. Job Execution</p> <p>3. Turning Operations: Between Centers Turning - Set up and carry out between centers turning operations for straight turning.</p> <p>4. Turning Operations: Chucking - Set up and carry out chucking.</p> <p>5. Milling: Square Up a Block - Set up and perform squaring up the six surfaces of a block to within +/- .002 and .002 over 4.5".</p> <p>6. Vertical Milling - Set up and operate vertical milling machine.</p> <p>D. Process Adjustment and Improvement</p> <p>1. Process Adjustment-Single Part Production.</p> | <p>9.B.5-6 Milling</p> <p>9.D.1 inspection</p> | <p>cylinders, linear equations and substitution, trig ratios, angles</p> <p>Whole #'s, decimals, fractions, cylinders, linear equations and substitution, angles, 3D shapes</p> <p>Whole #'s, decimals (1) solving linear equation, trig ratios (2),</p> | <p>6.NS.2; 6.NS.3; 6.NS.5; 6.NS.1; 6.EE.2; 7.NS.1; 7.NS.2; 7.NS.3; 6.EE.6; 6.EE.7; 6.EE.8; 6.EE.9; 7.EE.1; 7.EE.2; 7.EE.3; 7.EE.4; 8.EE.7; 8.EE.8; 8.F.4; 7.G.5; 6.G.1; 6.G.4; 6.G.6; 7.G.6; 8.G.9</p> | <p>A.APR.1; A.APR.7; N.RN.3; N.Q.1; A.CED.1; A.CED.2; A.CED.3; A.CED.4; A.REI.3; A.REI.4; A.REI.10; F.LE.1; F.LE.2; F.LE.5; F.IF.5; A.SSE.1; F.BF.1; S.ID.6; G.CO.9; G.CO.12; G.CO.13; G.SRT.8; G.SRT.10; F.TF.1; F.TF.3; F.IF.5; G.MG.1; G.GMD.2; G.GMD.3</p> |
| 10 | Manufacturing Processes | | | | |
| | <p>Production</p> <p>A. Diagnose production process problems and take corrective action to meet production quality standards.</p> <p>2. Suggest or perform corrective actions to correct quality problems.</p> <p>3. Determine appropriate action for sub-standard product.</p> <p>4. Identify trends using records of process outcomes.</p> <p>5. Implement closed-loop corrective action to provide for ongoing production feedback.</p> <p>6. Research energy consumption reduction in manufacturing.</p> <p>C. Make continuous improvement recommendations based on results of production process audits and inspections.</p> <p>1. Perform periodic internal quality audits</p> | <p>10.A.2-6 Quality control/Inspection</p> <p>10.C.1-6 Quality control/Inspection</p> | <p>chart and graph reading (Histogram, control charts, etc.) (2)</p> <p>chart and graph reading (Histogram, control charts, etc.) (2)</p> | <p>6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4</p> <p>6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4</p> | <p>S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1</p> <p>S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1</p> |

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| | <p>using company audit procedures.</p> <p>3. Recommend process improvements based upon audits and inspections.</p> <p>5. Document the results of quality testing using reliable data.</p> <p>6. Adjust processes to restore or maintain quality, based on data from audit or inspection reports.</p> <p>D. Coordinate work teams when producing products to enhance production process and performance.</p> <p>1. Coordinate work teams when producing products to enhance production process and performance.</p> <p>2. Develop team goals to enhance performance.</p> | <p>10.D.2 Enhance performance by increasing rate</p> | <p>Percentages</p> | <p>6.RP.2; 6.RP.3; 7.EE.2; 7.EE.3</p> | |
| | <p>Manufacturing</p> <p>A. Evaluate the nature and scope of the Manufacturing Career Cluster™ and the role of manufacturing in society and in the economy.</p> <p>1. Identify the role and major functions of manufacturing businesses.</p> <p>2. Describe how manufacturing businesses manage performance.</p> <p>3. Describe how changes outside the manufacturing business impact the manufacturing business.</p> <p>4. Explain the role of risk management in reducing risks and improving performance in manufacturing businesses.</p> <p>5. Identify the roles and functions of government in regulating and supporting manufacturing businesses.</p> <p>B. Analyze and summarize how manufacturing businesses improve performance.</p> | | | | |

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| | <p>2. Describe how planning and budgeting are used to accomplish organizational goals and objectives.</p> <p>3. Explain how planning is used to improve overall business performance.</p> <p>E. Describe government policies and industry standards that apply to manufacturing.</p> <p>1. Identify the major federal and state regulatory areas.</p> <p>2. Explain how government agencies ensure compliance with environmental regulations and promote improved performance.</p> <p>F. Demonstrate workplace knowledge and skills common to manufacturing.</p> <p>3. Describe various types of assembling processes (e.g., mechanical fastening, mechanical force, joining, fusion bonding, adhesive bonding) used in manufacturing.</p> | | | | |
| | <p>Career Ready Practices</p> <p>A. Career Ready Skills</p> <p>7. Employ valid and reliable research strategies.</p> <p>12. Work productively in teams while using cultural/global competence.</p> | | | | |
| 11 | Advanced Milling/Turning/Grinding | | | | |
| | <p>Technical Standards</p> <p>D. Process Adjustment and Improvement</p> <p>2. Participation in Process Improvement.</p> <p>M. Metalworking Theory</p> | 11.D.2 Process Improvement | Whole #'s, decimals, fractions, problem solving, | 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 7.EE.3; 6.NS.1; 6.EE.2 | A.APR.1; A.APR.7; N.RN.3; N.Q.1; N.Q.2; N.Q.3; S.ID.6 |

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|---------|---|---|--|---|---|
| | 5. Recognizes, selects, and applies appropriate coolants and coolant delivery systems. | | | | |
| | <p>Manufacturing</p> <p>F. Demonstrate workplace knowledge and skills common to manufacturing.</p> <p>4. Explain finishing processes (e.g., types of finishing materials, surface preparation, methods of application) used in manufacturing.</p> | | | | |
| | <p>Career Ready Practices</p> <p>A. Career Ready Skills</p> <p>11. Utilize critical thinking to make sense of problems and persevere in solving them.</p> | | Problem Solving | | N.Q.1; N.Q.2; N.Q.3; S.ID.6 |
| | <p>Technical Standards</p> <p>B. Job Execution</p> <p>8. CNC Programming - Using the principles of Cartesian coordinates develop a program for the manufacture of a simple part.</p> <p>N. Word address program codes</p> | 12.B.8 12.N.2&3 CNC Manufacturing | Whole #'s, decimals, fractions, Cartesian coordinate systems, problem solving, trig ratios, geometry | 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 7.EE.3; 6.NS.1; 6.EE.2; 7.G.5 | A.APR.1; A.APR.7; N.RN.3; N.Q.1; N.Q.2; N.Q.3; S.ID.6; G.CO.9; G.CO.12; G.CO.13; G.SRT.8; G.SRT.10; |

| Segment | CTE Segments/Performance Elements | CTE Concepts | Math Concepts | Common Core Math Standards Middle School | Common Core Math Standards High School |
|---------|--|--------------|---------------|--|--|
| | 1. Identify basic word address programming codes. 2. Identify Cartesian coordinates. 3. Understand incremental and absolute positioning and cutter compensation. | | | | F.TF.1; F.TF.3; F.IF.5 |
| | Career Ready Practices A. Career Ready Skills 6. Demonstrate creativity and innovation. 10. Use technology to enhance productivity. | | | | |

**Bridging the gap between Career and Tech Ed. Terms and Academic vocabulary

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