Job Planning, Benchwork and Layout  
Course Syllabus

Course Number: NCMT-1684   
OCAS Code: NONE   
Course Length: 75 Hours   
Career Cluster: Manufacturing   
Career Pathway: Production  
Career Major(s): Certified Machine Operator, Certified Machine Technician

Pre-requisite(s): In this course the student will develop the aptitude to read and understand the significance of drawings, learning the components, symbols, notations and the aspect of geometric dimensioning and tolerancing. The student will discover how these interwoven workings guide them/the machinist to a finished product by using layout methods, hand tools, saws, offhand grinding and basic hole making operations. Course objectives will be stated. Key terms and definitions will be studied. Upon completion of this course students should be able to successfully complete a NIMS certification exam in Job Planning, Benchwork and Layout.


Course Objectives:  
A. Understanding Drawings
   1. Importance of Engineering Drawings
   2. Components of Engineering Drawings
   3. Basic Symbols and Notation
   4. Tolerance
   5. Classes of Fit
   6. Geometric Dimensioning and Tolerancing (GD&T)
B. Layout
   1. Layout Fluid (layout dye)
   2. Semi-precision Layout
   3. Basic Layout Construction and Math
   4. Layout Procedure Guidelines
C. Hand Tools
   1. Screwdrivers
   2. Pliers
   3. Hammers
   4. Wrenches
   5. Bench Vise
   6. Clamps
   7. Hacksaws
   8. Files
   9. Deburring
  10. Abrasives
D. Saws and Cutoff Machines
   1. Power Hacksaws
   2. Band Sawing Machines
   3. Saw Blade Characteristics and Applications
   4. Band Saw Blade Welding
   5. Band Saw Blade Mounting/Removal
   6. Blade Speed
   7. The Abrasive Cutoff Saw
   8. Metal Cutting Circular (Cold) Saws

E. Offhand Grinding
   1. Grinder Uses
   2. Abrasive Belt and Disc Machine Uses
   3. Grinding Wheels
   4. Pedestal Grinder Setup
   5. Grinding Procedures

F. Drilling, Threading, Tapping and Reaming
   1. Benchwork Holemaking Operations
   2. Threading and Tapping

Teaching Methods: The class will be taught primarily by the lecture and demonstration method, supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

Grading Procedures: 1. Students are graded on theory and shop practice and performance.
   2. Each course must be passed with seventy (70%) percent or better.
   3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

Description of Classroom, Laboratories, and Equipment: Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.

Available Certifications/College Credit: The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

College Credit Eligibility: The student must maintain a grade point average of 2.0 or better.