Course: MAC

Title: Advanced Inspection Techniques II

Long Title: Advanced Inspection and applied Geometric Dimensioning and Tolerance

Course Description: This Course expands on the ideas presented in MAC 250, MAC1 02 and EGT 205.

Min Credit: 3

Standard competencies:

1. Demonstrate hands on use of 3D geometry based Geometric Dimensioning and Tolerance
2. Operate 5 axis CMM programming
3. Demonstrate Video Measuring System setup and operation

Topical Outline:

1. 3D geometry based Geometric Dimensioning and Tolerance
2. Applied use of the 3 degrees of freedom
3. Applied use of GD&T Patterns
4. 5 axis CMM Programing
5. CMM Software Training
6. Program from Solid Model
7. Collision Avoidance
8. CMM measurement verification
9. Video Measuring System Setup and Operation
10. Software training
11. Machine Setup

Course: MAC267

Title: Metrology Maintenance

Long Title: Metrology Maintenance

Course Description: Focuses on precise measurement and inspection techniques and maintenance of equipment to ensure that machined parts are within required parameters.

Min Credit: 3

Standard competencies:

1. Demonstrate effective shop and building safety procedures.
2. Analyze fits and perform part fit-up and inspection.
3. Perform, interpret, and report on manufacturing process-based inspection.
4. Perform preventive maintenance on measuring equipment.
5. Develop preventive maintenance schedules.
6. Identify potential points of equipment wear and fatigue.
7. Verify equipment calibration.
8. Trouble-shoot erroneous measurements.

Topical Outline:

1. Safety
   1. Shop safety rules
   2. Student responsibilities
   3. Building safety procedures
   4. Equipment safety demonstration
   5. Equipment care for lab use
2. Types of fits and part fit up Inspection
   1. Interference fit
   2. Sliding Fits
   3. Clearance Fit
3. Manufacturing Process based Inspection
   1. Turned Parts
   2. Milled Parts
   3. Other Processes
4. Measuring equipment maintenance
   1. CMM (Coordinate Measuring Machine) measurement verification
   2. Video Measuring System verification
   3. Hand tool use and verification
   4. Cleaning
   5. Preventive maintenance
   6. Wear/fatigue inspection
   7. Failure points
   8. Troubleshooting