Course Objectives/Course Outline
Spokane Community College

Course Title: **Precision Machining I**
Prefix and Course Number: **APM 101**

Course Outcomes:
By the end of this course, a student should:

- Demonstrate shop safety and shop maintenance protocols
- Demonstrate a high level of professionalism, etiquette and pride in the machining craft
- Recognize major tools (including hand tools) of the trade and understand what they are used for
- Demonstrate the use of safety equipment and materials, including; PPE (personal protective equipment). Tool guards and safety shields, Material Data Safety Sheets (MSDS), Hazardous Materials cleanup procedures and materials
- Identify basic materials that are commonly used in aerospace and describe the types and forms
- Interpret basic blueprint drawings, including lines, dimensioning and tolerances
- Define 5S, lean manufacturing and JIT
- Develop a basic understanding of project planning, including material prep with saws, drills and mills
- Use basic and precision measuring tools to calculate measurements and tolerances
- Demonstrate ability to take raw material to finished product
- Design and complete a basic (machining) project utilizing the following skills: Part marking, hole finishing and reaming, tapping, hand threading, sawing material with excess, part finishing
- Recognize steps required to make a standardized finished product
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Course Outline:

I. Week One
- A. Course Review and Introduction
- B. Overview of Manufacturing
- C. Standardized Manufacturing in Aerospace
- D. Lean Principles, Recycling
- E. General Shop Safety, SDS, HazMat, Shop Safety Tour: (chemicals, fire extinguishers, emergency exits, housekeeping, cleaning supplies)

II. Week Two
- A. Machine Safety, Anatomy & Use: (lathes, mills, grinders)
- B. Shop Tour: Machine Specific
- C. Safety Videos, Safety Quiz
- D. Math (dimensions, speeds and feeds)

III. **Week Three**
   A. Job Planning and Drawings
   B. Intro to Precision Measurement
   C. Intro to Bench Block Project (lathe set up, facing the bench block)

IV. **Week Four**
   A. Continue Bench Block Project (lathe set up, facing the bench block) work holding, edge finder, milling the flat, layout holes, drilling, tap or ream, countersink)

V. **Week Five**
   A. Continue Bench Block Project Mid-Term Review

VI. **Week Six**
   A. Review and Midterm (class & shop)
   B. Continue Bench Block Project

VII. **Week Seven**
   A. Continue Bench Block Project (drills and drill safety, basic drilling techniques, hand sharpen drills)

VIII. **Week Eight**
   A. Continue Bench Block Project (thread basics, threading by hand, hole finish/reaming)

IX. **Week Nine**
   A. Continue Bench Block Project (part finish, material identification)

X. **Week Ten**
   A. Continue Bench Block Project

XI. **Week Eleven**
   A. Review for Final
   B. Continue Bench Block Project

XII. **Week Twelve**
   A. Review
   B. Written Final and skills checklist