# California North Bay Chapter of the NTMA
# APPRENTICESHIP PROGRAM
# FOURTH YEAR SYLLABUS, 2007-2008

## Thursdays; 6:00 – 10:00 Petaluma High, Room A6, 36 weeks

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**MAJOR TOPICS FOR THE FOURTH YEAR:**

A. Process Planning
B. Computer Aided Design Tools: Autodesk Inventor for 3D modeling and 2D drawings
C. Cost Estimating
D. Maros/sub Routines (G-code)
E. Advanced GD&T
F. Computer Aided CNC Programming (MasterCAM)
G. Quality: Statistical Process Control and Continuous Process Improvement
H. Projects: Design, Plan and Document Process, Estimate Cost, Design Tooling, Program
I. Rapid Prototyping Processes

**COURSE DESCRIPTION:** Class time will include lectures, demonstrations, discussions, videos, cooperative tasks, and hands-on practice with design and manufacturing software. Machine operation is not emphasized, but we may produce parts in order to verify programs and manufacturing concepts. Students are encouraged to bring their on-the-job experience into the classroom, so that the connections between theory and practice can be emphasized. Therefore, students are always encouraged to ask questions and bring up course-related issues for discussion.

- Each student will undertake a project to design, and document a part, including process planning, cost estimating, tool design, and CNC programming. CAD and other software tools will be learned and used in this process. The goal is to integrate the student's practical experience with manufacturing engineering skills such as process planning and quality management, together with the use of appropriate computer software.

- Each student will prepare a presentation on a manufacturing-related topic of his/her choice, to be presented to the class during the second semester. The instructor will provide guidance on topic choice and research and presentation methods.

- Reading and written homework will be assigned regularly, and will be discussed in the next class. Homework is expected on the date due, and only partial credit will be given for assignments turned in late.

- Short quizzes will be given frequently. Students will complete a mid-term exam in January and a final exam near the end of May.

**PREREQUISITES:** Successful completion of the third year, number of hours required, and satisfactory evaluations from the employers and the NTMA apprenticeship committee.

**REQUIRED TEXT:** None

**GENERAL PERFORMANCE EXPECTATIONS:**

- Attendance: minimal number of absences (see ***evaluation***, below).
- Active participation in discussions: State your opinion (and be ready to answer questions about why you hold it!).
- Read any assigned material, so you can participate.
- Complete homework assignments on time
- Arrive on time – you're responsible for whatever goes on between 6 pm and 10 pm.
- Take notes to remember what we've covered – you'll have to know it at exam time.

**EVALUATION:** Progress evaluation will be by means of quizzes, mid-term and final examinations, homework assignments, class participation and project work. Points as follows:

- **Attendance:** **20%**
  No missed classes = A, 4 hours missed = B, 8 = C, More than 8 = F (for this item)
  Missing more than 8 hours per semester can result in **removal from program**!
- **Reading, Assignments, Quizzes** **20%**
- **Class Participation** (Discussion etc.) **20%**
- **Design & Manufacturing project** **20%**
- **Midterm & Final Exam, 10% each** **20%**

Grade Calculation: Sum of the five elements listed above

A = 100 - 90 points
B = 89 - 80 points
C = 79 - 70 points
D = 69 - 60 points
F = Less than 60