California Tooling and Machining Apprenticeship Association

APPRENTICESHIP PROGRAM
THIRD YEAR SYLLABUS
Thursdays, 6:00pm – 10:00pm
Petaluma High School room A6
Instructor:
E-mail: **Cell:**

COURSE DESCRIPTION: The third year program consists of classroom and computer lab instruction for 4 hours once a week for two semesters (36 meetings). The material to be covered will build on the knowledge foundation of the first two years, as well as introducing new topics. Classroom activities will include lecture, discussion, hands-on exercises and experiments, group work, and individual, self-paced work.

PREREQUISITES: Successful completion of the second year, number of hours required, and satisfactory evaluations from the employers and the CTMAA apprenticeship committee.

COURSE CONTENT: Class lectures and laboratory exercises and experiments are the core of the course, so regular attendance is required. In addition, field trips and speakers are required elements of the course, as scheduled by the instructor.

REQUIRED TEXT:

Metallurgy Fundamentals, by Daniel Brandt and J.C. Warner. ISBN 1-56637-543-6

SUPPLEMENTARY TEXTS: Materials handbook, Brady
Machinery Handbook, recent edition -- GD&T Reference Books

MATERIALS: Binder, pens/pencils, calculator, flash drive (optional)

ATTENDANCE: Attendance is a critical element of this program. Missed classes should be avoided except for illness or emergencies. Students who MUST miss a class should notify the teacher in advance. Students MUST make up all work. When a student misses 2 classes or 8 hours of instruction the CTMAA Apprentice Program Coordinator and/or board will contact the apprentice sponsor for appropriate action(s).

EVALUATION:

A. **Attendance: 100 points**
No missed classes = 100, 2 hr. missed = 86, 4 = 78, 8 = 70, More than 8 = 0
Missing more than 8 hours per semester can result in removal from program!

B. **Reading, Assignments, Quizzes & Mid-Term. 100 points**
50 points each semester

C. Outside Assignments, projects, Library, Using Resources 100 points
50 points each semester

D. Lab Experiments and Reports
50 points each semester **100 points**

E. Final Exam 100 points

Grade Calculation:

$$\frac{A + B + C + D + E}{5} = \text{Grade Point Average}$$

100 – 90 pts = A, 89 – 80 points = B, 79 – 70 pts = C, 69 – 60 points = D, Below 60 = F

CLASS LECTURE ACTIVITY AND TIME FRAME:

Class activity will be conducted within the 4-hour time schedule, which includes time to attend to apprentice and NTMA business matters. However, homework assignments are to be completed outside of class time.

CLASSROOM SUBJECT ACTIVITY AND FOCUS:

The revised curriculum for the third year is to be focused on the following discipline areas. Since the relationship between the real world and the classroom is important for effective learning, I encourage students to bring questions and examples from the workplace that relate to the topic currently under study.

MAJOR DISCIPLINE AREAS AND FOCUS OF THE THIRD YEAR:

1) Metrology
    a) principles of precision measurement
    b) use of measuring devices
    c) principle and use of Vernier scale
    d) measurement uncertainty – how much and why?
    e) sources of measurement error, and how to minimize error
2) G.D. & T. Principals and their relationship to measurement
3) Intro to Excel Spreadsheets – formatting information and making calculations
4) Introduction to 3D modeling
5) Basic principles of quality and Statistical Quality Control
6) CMM
7) Material Science
8) Metallurgy,
    a) Ferrous
    b) Nonferrous
9) Plastics: characteristics of select materials
10) CNC Programming and Machine Principals

Possible additional topics:

11) Math:
    a) review trigonometry
    b) review geometry
    c) use of calculator
12) Sandvik Carbide Application Course
13) Tool & Die / Grinding