# ADVANCED MANUFACTURING ADVISORY MEETING

| MEETING DATE: | JUNE 10, 2015 |
| PLACE/ ROOM: | APPLE VALLEY HIGH SCHOOL/ C-3 |

| NAME | TITLE | COMPANY | PHONE | E-MAIL |
|------|-------|---------|-------|--------|
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## Course Books:

1. Precision Machining Technology

   *By: Peter J. Hoffman, Eric S. Hopewell, Brian Janes and Kent M. Sharp Jr.*

2. Mathematics for Machine Technology 6E

   *By Smith & Peterson*

3. Basic Blueprint Reading & Sketching 9th Edition

   *By: Thomas P. Olivo*

## Course Philosophy

The availability of skilled workers in the machinist trade is a national crisis. To be competitive in the global economy, the United States of America must train workers for the ever-changing world. Machine Technology at Mira Costa Machine College is immersed in the basics of the machine technology trade. Students continue to learn about manufacturing processes through the use of common manual machining tools. Students will learn about machining and manufacturing through a project-based curriculum. These skills include: the ability to work safely and thoughtfully on a variety of machine tools and to create functional products from various materials. There is an emphasis on planning, organizing and utilizing the available equipment to create the products in the defined curriculum. Students continue their exploration of how technology defines the modern world.

## Course Description

The Machine Technology course is based on tasks to teach specific skills on the lathe and milling machine.

Students quickly learn that tolerances must be maintained if the completed project is to function properly. These projects will include the following concepts:

1. Special attachments and machine setups for lathes and milling machines
2. Manufacturing products using blueprints on the Lathe.
3. Manufacturing products using blueprints on a Milling Machine.
4. Measuring tools for inspection of finished products.
5. Indicators and indicating for precision locating.

Safety on the standard shop equipment and the proper use of all tools and materials is emphasized. School procedures for emergencies such as fire safety are revisited.  Students learn intermediate and

Performance (70%)

Final Examinations:

"Final examinations must be taken when scheduled. A grade of "F" will be given for any examination missed unless previously approved by the Instructor.

**Program Activities**

Machine Technology:

• Safety (PPE, Means of egress and fire protection)

• Instructor assigned milling task

  ○ Mill work piece using climb and conventional methods

• Instructor assigned lathe task

• Indicators for inspecting tasks and for setting machine tools.

• Measurement Tools (Telescope gage, Gage Blocks, Micrometers, Depth

Micrometers, Indicators and height gages)

• Math topic machining calculations

• Blueprint Reading Intermediate

• Instructor assigned lathe, drill press and mill project

• Related theory including blueprint reading and shop trigonometry.

• Special Projects

• Final Exam

**Week Two**

Day One

- *Quiz*
- Understanding Drawings

Resource: Basic Blueprint Reading and Sketching

- Bases for Blueprint Reading and Sketching  ( 10 Chapters)

Resource: Precision Machining Technology

- Layouts
- Hand tools
- Saws and Cutoff Machines
- Offhand Grinding

Day Two

- Drilling Threading Tapping and Reaming
- Drill Press
- Work holding and Tool holding Devices for Drill Presses
- Drill Press Operations
- Introduction To Machine Shop Safety

Day Three

- Quiz
- *Layout, Drill and Tap Project*

Day Four

- *Layout, Drill and Tap Project*

Day Five

- *Layout, Drill and Tap Project*

**Week Three**

Resource: Precision Machining Technology

Day One

- Introduction to Manual Lathes
- Work holding and Tool holding devices for Lathes
- Lathe Machining Operations
- Taper Turning
- Shop Safety

**Week Seven**

Resource: Precision Machining Technology

Resource: HAAS Lathe Programming Book

Resource: Master Cam Lathe Training Guide

Day One

- Introduction to CNC Basics
- Introduction to CNC Lathe
- Lathe Programming
- Lathe Set-up / Operation
- HAAS Lathe Programming Workbook

Day Two

- HAAS Lathe Programming Workbook
- Master Cam Lathe design

Day Three

- Master Cam Lathe design

Day Four

- Simulator / Projects

Day Five

- Simulator / Projects

**Week Eight**

Day One – Five

- Simulator / Projects

**Week Nine**

Resource: Precision Machining Technology

Resource: HAAS Mill Programming Book

Resource: Master Cam Mill Training Guide

Day One

- Introduction to CNC Milling
- Milling Programming
- Milling Set-up and Operation
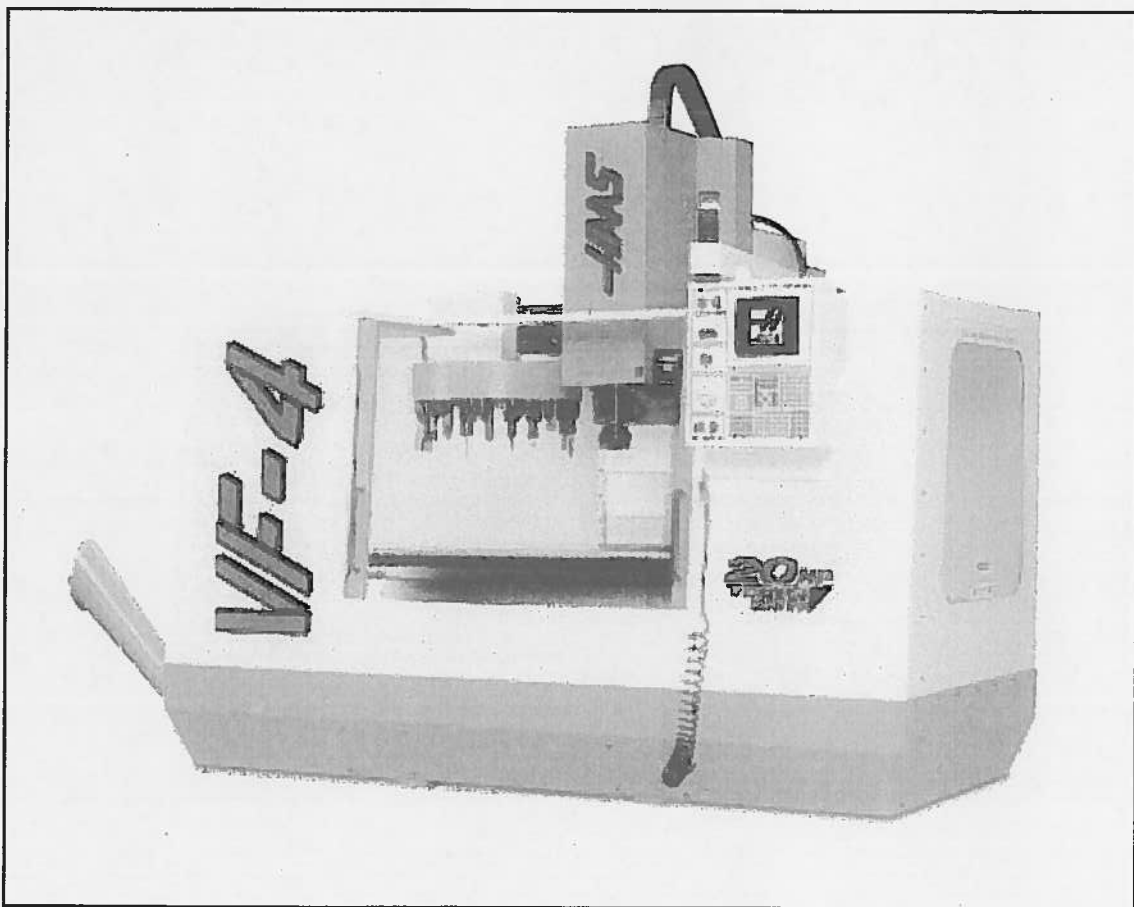- HAAS Mill Programming Workbook

Day Two

# VF/HS Series
## CNC MACHINE

**HAAS**
**Haas Automation**

# PROGRAMMING WORKBOOK



**HAAS AUTOMATION, INC.**
**2800 Sturgis Rd.**
**Oxnard, CA 93030**

# Norco College Class Descriptions

## 27 Units, 778 hours = 30 hrs/wk for 26 weeks

### ENE-51 - Blueprint Reading 2 units
### CSU
*Prerequisite: None.*
A beginning course in the study of blueprints and their interpretation, types of projection, symbols and abbreviations. This course is designed for students interested in print reading for the machine trades. 27 hours lecture and 27 hours laboratory.

### MAN-56 - CNC Machine Set-up and Operation 4 units
*Prerequisite: None.*
Fundamental skills related to the setup and operation of CNC (Computer Numerically Control) machine tools. Students will setup and operate CNC machine tools exposing them to CNC controllers and some CNC manual programming. Students will gain hands-on experience with CNC machine tools. 54 hours lecture and 54 hours laboratory.

### MAN-55 - Occupational Safety and Health 2 units
### Administration (OSHA) Standards for General Industry
*Prerequisite: None.*
This course covers OSHA policies, procedures, and standards, as well as safety for general industry and health principles. Topics include scope and application of the OSHA general industry standards. Special emphasis is placed on those areas that are the most hazardous, using OSHA standards as a guide. Upon successful completion, the student will receive either an OSHA 10 or 30 hour general industry or construction training completion card. 36 hours lecture. (Letter Grade, or Pass/No Pass option.)

### ENE-60 - Math for Engineering Technology 3 units
*Prerequisite: None.*
A course in mathematical problems frequently used by students enrolled in the trade and industrial and engineering programs. This course reviews basic arithmetic, linear measurement, basic algebra, basic plane geometry, trigonometry, and compound angles. 54 hours lecture. (Letter Grade, or Pass/No Pass option.)

### ENE-52 - Geometric Dimensioning and Tolerancing 2 units
### CSU
*Prerequisite: None.*
A course presenting the basics of the Standards of Geometric

Dimensioning and Tolerancing. This course will help students read, interpret and use ANSI Y14.5M, the current standard for drafting. 36 hours lecture. (Letter Grade, or Pass/No Pass option.)

### ENE-30 - Computer Aided Drafting (CAD) 3 units
**CSU**
*Prerequisite: None.*
*Advisory: CIS-1A.*
A two-dimensional computer aided drafting class for drafters. Students will use an AUTOCAD computer drafting system to develop "computer drawn" drawings which are typical to the various fields of drafting. 27 hours lecture and 90 hours laboratory.

### MAN-57 - CNC Program Writing 3 units
*Prerequisite: None.*
Introduction to manual CNC program writing. This course includes the Cartesian coordinate system, absolute/incremental programming, circular interpolation, cutter radius compensation, canned cycles, and other programming techniques related to CNC machine tools. Students will gain hands-on experience with CNC machine tools. 40 hours lecture and 72 hours laboratory.

### MAN-35 - Computer-Aided Manufacturing–Mastercam 5 units
*Prerequisite: None.*
*Advisory: CIS-1A.*
A course in computer-aided manufacture of parts and assemblies using MasterCam software. Applications of Numerical Control (NC) programming in machine processes with a focus on turning centers and milling operations. This course includes beginning and advanced programming. 63 hours lecture and 81 hours laboratory. (Letter Grade, or Pass/No Pass option.)

### ENE-42 - SolidWorks I 3 units
**CSU**
*Prerequisite: None.*
This course is designed to introduce the student to threedimensional parametric solid modeling with SolidWorks. Students will begin with basic parametric solid modeling techniques and advance into complex assemblies requiring animation. 27 hours lecture and 90 hours laboratory.