

Lassen Community College Course Outline

GS 51 Gunsmith Machining - Advanced

5.0 Units

I. Catalog Description

This course is designed to teach the gunsmithing student to safely operate an engine lathe and vertical knee mill. The topics that will be covered include: boring holes on both a lathe and mill, cutting internal taper to match a master, cutting internal threads to match a master, the use of a universal dividing head to complete a multi-faceted project, the use of a rotary table to complete complex drill pattern or radius cut using the mill. This course will also include information on basic CNC setup and operation. This course will consist of two hours lecture and nine hours lab weekly.

Prerequisites: GS-50

Recommended Preparation: Successful completion of ENGL105 or equivalent.

Transfer Status: Not transferable

34 Hours Lecture, 153 Hours Lab, 68 Out of Class Hours, 255 Total Hours of Instruction

Scheduled: Spring semester only

II. Coding Information

Repeatability: Not Repeatable

Grading Option: Graded only

Credit Type: Credit - Degree Applicable

TOP Code: 095630

III. Course Objectives

A. Course Student Learning Outcomes

Upon completion of this course the student will be able to:

1. Safely operate an engine lathe to complete complex assigned projects to industry standard or better.
2. Safely operate a vertical knee mill to complete complex assigned projects to industry standard or better.

B. Course Objectives

Upon completion of this course the student will be able to:

1. Safely operate an engine lathe and vertical knee mill.
2. Complete assigned projects using appropriate machining operations.

IV. Course Content

A. Outline of Topics

1. Boring holes on both a lathe and mill
2. Cutting internal taper to match a master
3. Cutting internal threads to match a master
4. The use of a universal dividing head to complete a multi-faceted project
5. The use of a rotary table to complete complex drill pattern or radius cut using the mill
6. Basic CNC setup and operation

V. Assignments

A. Appropriate Readings

Trade manuals will be the primary reference sources, access will be provided by the instructor, may also include instructor handouts. Additional information resources will include product and use guides from industry manufacturers to enhance the learning process.

B. Writing Assignments

Students will be required to complete a set of notes covering lectures, labs and demonstrations. Notes will include appropriate diagrams, when applicable, for clarity of information. Assignments may be made involving repair, refinishing, and/or modifications to the studied firearm parts. Assignments will proximate problems actually encountered in the field. Performance levels must meet or exceed industry and/or shop specifications.

C. Expected Outside Assignments

Students will be required to complete two hours of outside-of-class homework for each hour of lecture. Pertinent supplementary literature and research assignments.

D. Specific Assignments that Demonstrate Critical Thinking

Assignments may include the design and fabrication of a tool, new ideas toward manufacturing techniques, new ways to assemble a gun, new modification techniques. Example: The student will be told what a tool must do and then must design and fabricate the tool without being given dimensions of other information.

VI. Methods of Evaluation

Traditional Evaluation

Student will be evaluated on:

1. Completion of assignments in a timely manner.
2. Completed assignments must meet or exceed industry standard.
3. Lecture notes including line drawings and pictures for clarification must be complete.
4. Final examination may include a practical demonstration of skills learned during the course.

VII. Methods of Delivery

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

Traditional Classroom Delivery

Correspondence Delivery Hybrid Delivery Online Delivery

Traditional Classroom Instruction

Lecture, discussion, audio/visual aids, demonstration, group exercises, guest speakers, lab, individualized programs and other as needed.

VIII. Representative Texts and Supplies

Required Textbook

Dixon, Bob and Walker, John R. Machining Fundamentals, 11th Edition, 2023, Goodheart – Willcox, ISBN: # 978-1-64925-979-0

Required Firearms First Year

- 1 Safety breech bolt action rifle (Remington 700)
- 1 Flat breech bolt action rifle (Mauser 98, Ruger 77, Savage 110)
- 1 Other bolt action rifle of your choice

The following guns can be from the second year firearms list.

- 2 Handguns
- 4 .22 Rifles
- 2 Shotguns
- 2 Other Centerfire Rifles

Required Tools and Materials

- Safety glasses
- Parrot Multi vice
- Layout fluid (Dykem)
- Steel or carbide scribe
- Steel machinist's Protractor
- 4x 3/8" HSS Tool bits
- 60 Deg Center Gauge
- #3 Center Drill
- 6" dial Caliper
- Steel Rule
- Chip brush
- Shop rags
- 8-10" Mill Files (1 each)
 - Smooth Cut
 - Second Cut
 - Bastard Cut
- File handles for all files
- Hacksaw and blades
- 4 OZ. Ball Peen Hammer
- Assorted flat blade screwdrivers (Fixed type, not magnetic tip)
- 10" Adjustable Wrench
- Allen Wrenches, Standard and Metric
- Tapered feeler gauges
- Tool box for your belongings-Bench Top, not roll away type
- Padlock
- 3 corner file (Three square file)
- 3/16" Chainsaw File
- Needle file Set
- File Card
- Stones: (1/2"x1/2"x6"):
 - 1 Medium
 - 1 Fine
 - 1 Extra fine
- Dial Indicator, 0-1" w/ Magnetic Base
- Gun Cleaning supplies (Rods, Brushes, Jags, Patches, Solvent)
- Pin Punch Set
- Extra 1/16" punches

Depth Micrometer, 0-1"
Needle Nose Pliers
Sand Paper (min 5 sheets each):
150 Grit
220 Grit
320 Grit
400 Grit
Steel wool, '0000'
Aluminum Oxide General Purpose Shop Rolls 1" wide
220 Grit
320 Grit
Acetone
Simple Green w/ Spray bottle
Breakfree Gun Oil (pump or aerosol)
Toothpicks
Q-tips
Thread Locker (Medium and High Strength)
Dust Masks or Respirator
Dremel or Foredom Tool with Accessories
Masking tape
#5 Welding Goggles
1/16" 2% Thoriated Tungsten Welding electrodes (Red)
Thin Welding Gloves-TIG
Welding Helmet w/ #10 lens-TIG
Stainless Steel wire Brush, small
Quality Drill Index
Mechanical Edge Finder
End Mills, Center Cutting HSS Standard up to ½ inch
Tap Set Complete set to ½" and includes: 6-48, 8-40, similar to Brownells #2 Tap Set
Tap Fluid
Tap Handle (may not be included in set)
Propane or MAP Gas Torch
Tooth Brushes
C Clamps:
2 @3"
2 @5"
Tape Measure
Cross Test Level
Mallet, 10-12 OZ. Non-marring
Scissors
Small Flashlight
Latex/Nitrile Disposable Gloves
One set screw on sights
One set dovetail sights
Dovetail Cutter (3/8"x60 Deg OR .330"x65 Deg-to match your sights)
Assortment of Wooden Dowels
A wide assortment of rubber corks to plug bores and muzzles
Chemical Resistant spray Bottle

Two part epoxy 24hour cure
ACRAGLASS or ACRAGEL bedding Compound
Release Agent
Cerakote Starter Kit OR 1 Can OF TEFLONMOLY, OR GUNKOTE
3 Grind to Fit Recoil Pads
.22 Barrel Liner Drill bit
.22 Barrel Liner
A 2 Sear Trigger such as Timney, or Jard for a centerfire bolt action rifle of your choice
Quality Steel Scope Bases and horizontally split steel rings
Rifle Scope of your choice
Weld-on bolt handle
Jewell Trigger for Remington 700 (Hunter)
White Cotton Gloves
A roll of bailing wire
36" length of 1/4" Allthread with nuts and washers to fit
20 gauge Sheet Steel (aprox 12"x12")
Assorted Spring Stock (Flat and Round) Brownells
2 Pre contoured barrels (un-threaded and un-chambered)
1 un-contoured barrel blank
A Semi-inletted wood stock for a bolt action rifle of your choice
Foam-Filled Fiberglass stock for a bolt action rifle of your choice
Cold Rolled Round stock Steel (10' Lengths):
1/2", 3/4", 1", 1 1/4"
Flat Bar Stocks 27" length of 1"x2"
Flat Bar Stocks 24" length of 1/2"x1-1/2"
Aluminum Bar Stock (1 piece of each dimension below)
1"x3"x6"
36" length of 1/4" & 1/2" Drill Rod
This may not be a complete list of tools and materials, other things may be necessary depending on the particular firearms you choose to bring and projects you attempt to complete.

IX. Discipline/s Assignment

Gunsmithing

X. Course Status

Current Status: Active

Original Approval Date: 09/06/2022

Course Originator: John Martin

Board Approval Date: 10/11/2022

Chancellor's Office Approval Date:

Revised By:

Curriculum/Academic Standards Committee Revision Date: