Lassen Community College Course Outline

GS 50 Gunsmith Machining - Basic 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: basic blue print reading, project layout, basic machine setup and adjustment, tool grinding, turning, external single point threading, cutting of "V", square and buttress threads, cutting external tapers, proper use of end mills, advantages/disadvantages of conventional verses climb milling and basic milling operations. This course will consist of two hours lecture and nine hours lab weekly.

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: Fall 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 simple assigned projects to industry standard or better.
2. Safely operate a vertical knee mill to complete simple 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. Properly grind tool bits for the project with appropriate relief and cutting angles.
3. Cut single point threads of correct size and pitch.
4. Using proper milling technique complete simple projects on the vertical knee mill.

IV. Course Content

A. Outline of Topics

1. Basic blue print reading and project layout.
2. Basic machine setup and adjustment.
3. Tool bit geometry and grinding.
4. Basic turning.
5. Single point threading ("V", square and buttress threads).

6. Cutting external tapers.
7. Proper use of end mills.
8. Advantages/disadvantages of conventional verses climb milling.
9. Basic milling operations.

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 ¼"
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 ¼"& ½" 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: