

Lassen Community College Course Outline

GS 59 Understanding Headspace and Handloading

2.0 Units

I. Catalog Description

This course is designed to teach the gunsmithing student to understand, measure and correct headspace in all common types of firearms and cartridges. Handloading and cartridge testing will also be covered during this course. The topics that will be covered include: cartridge design and its relationship to headspace measurements, methods of correcting headspace, handloading and cartridge testing. This course will consist of one hour lecture and three hours lab weekly.

Diversity Statement

Our commitment to diversity requires that we strive to eliminate barriers to equity and that we act deliberately to create a safe and inclusive environment where individual and group differences are valued and leveraged for the growth and understanding as an educational community.

Corequisite: GS 50

Recommended Preparation: Successful completion of ENGL105 or equivalent.

Additional Course Information:

Transfer Status:

- NT

Total Number of Hours by Instructional Method:

- 17 Hours Lecture, 51 Hours Lab, 34 Out of Class Hours, 102 Total Hours of Instruction

Scheduled:

- Every Fall

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. Demonstrate a complete understanding of headspace and its importance.
2. Safely develop handloads for specific firearms that meet or exceed industry

performance standards.

B. Course Objectives

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

1. Correctly measure headspace
2. Understand its importance and how to correct it
3. Develop handloads for specific firearms
4. At the range testing those loads to prove their performance

IV. Course Content

A. Outline of Topics

1. Cartridge design and its relationship to headspace measurements
2. Methods of correcting headspace
3. Handloading
4. Cartridge testing and evaluation

V. Assignments

A. Appropriate Readings

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

B. Writing Assignments

1. 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.
2. Assignments may be made involving repair, refinishing, and/or modifications to the studied firearm parts. Assignments will approximate problems actually encountered in the field. Performance levels must meet or exceed industry and/or shop specification.

C. Expected Outside Assignments

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

D. Specific Assignments that Demonstrate Critical Thinking

1. 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

List general evaluation methods (i.e., mixed format exams, participation, written essays, oral and listening exams)

Traditional Evaluation

Project completion, function, fit and finish, homework, classroom discussion,

essay, journals, lab demonstrations and activities, multiple choice quizzes, and participation.

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 Delivery

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

VIII. Representative Texts and Supplies

A. Required Firearms First Year

1. 1 Safety breech bolt action rifle (Remington 700)
2. 1 Flat breech bolt action rifle (Mauser 98, Ruger 77, Savage 110)
3. 1 Other bolt action rifle of your choice
4. The following guns can be from the second year firearms list.
5. 2 Handguns
6. 4 .22 Rifles
7. 2 Shotguns
8. 2 Other Centerfire Rifles

B. Required Tools and Materials

1. Safety glasses
2. Parrot Multi vice
3. Layout fluid (Dykem)
4. Steel or carbide scribe
5. Steel machinist's Protractor
6. 4x 3/8" HSS Tool bits
7. 60 Deg Center Gauge
8. #3 Center Drill
9. 6" dial Caliper
10. Steel Rule
11. Chip brush
12. Shop rags
13. 8-10" Mill Files (1 each)
14. Smooth Cut
15. Second Cut
16. Bastard Cut
17. File handles for all files
18. Hacksaw and blades
19. 4 OZ. Ball Peen Hammer

20. Assorted flat blade screwdrivers (Fixed type, not magnetic tip)
21. 10" Adjustable Wrench
22. Allen Wrenches, Standard and Metric
23. Tapered feeler gauges
24. Tool box for your belongings-Bench Top, not roll away type
25. Padlock
26. 3 corner file (Three square file)
27. 3/16" Chainsaw File
28. Needle file Set
29. File Card
30. Stones: (1/2"x1/2"x6"):
31. 1 Medium
32. 1 Fine
33. 1 Extra fine
34. Dial Indicator, 0-1" w/ Magnetic Base
35. Gun Cleaning supplies (Rods, Brushes, Jags, Patches, Solvent)
36. Pin Punch Set
37. Extra 1/16" punches
38. Depth Micrometer, 0-1"
39. Needle Nose Pliers
40. Sand Paper (min 5 sheets each):
41. 150 Grit
42. 220 Grit
43. 320 Grit
44. 400 Grit
45. Steel wool, '0000'
46. Aluminum Oxide General Purpose Shop Rolls 1" wide
47. 220 Grit
48. 320 Grit
49. Acetone
50. Simple Green w/ Spray bottle
51. Breakfree Gun Oil (pump or aerosol)
52. Toothpicks
53. Q-tips
54. Thread Locker (Medium and High Strength)
55. Dust Masks or Respirator
56. Dremel or Foredom Tool with Accessories
57. Masking tape
58. #5 Welding Goggles
59. 1/16" 2% Thoriated Tungsten Welding electrodes (Red)
60. Thin Welding Gloves-TIG
61. Welding Helmet w/ #10 lens-TIG
62. Stainless Steel wire Brush, small
63. Quality Drill Index
64. Mechanical Edge Finder
65. End Mills, Center Cutting HSS Standard up to 1/2 inch
66. Tap Set Complete set to 1/2" and includes: 6-48, 8-40, similar to Brownells #2
67. Tap Set

68. Tap Fluid
69. Tap Handle (may not be included in set)
70. Propane or MAP Gas Torch
71. Tooth Brushes
72. C Clamps:
73. 2 @3"
74. 2 @5"
75. Tape Measure
76. Cross Test Level
77. Mallet, 10-12 OZ. Non-marring
78. Scissors
79. Small Flashlight
80. Latex/Nitrile Disposable Gloves
81. One set screw on sights
82. One set dovetail sights
83. Dovetail Cutter (3/8"x60 Deg OR .330"x65 Deg-to match your sights)
84. Assortment of Wooden Dowels
85. A wide assortment of rubber corks to plug bores and muzzles
86. Chemical Resistant spray Bottle
87. Two part epoxy 24hour cure
88. ACRAGLASS or ACRAGEL bedding Compound
89. Release Agent
90. Cerakote Starter Kit OR 1 Can OF TEFLONMOLY, OR GUNKOTE
91. 3 Grind to Fit Recoil Pads
92. .22 Barrel Liner Drill bit
93. .22 Barrel Liner
94. A 2 Sear Trigger such as Timney, or Jard for a centerfire bolt action rifle of your choice
95. Quality Steel Scope Bases and horizontally split steel rings
96. Rifle Scope of your choice
97. Weld-on bolt handle
98. Jewell Trigger for Remington 700 (Hunter)
99. White Cotton Gloves
100. A roll of bailing wire
101. 36" length of 1/4" Allthread with nuts and washers to fit
102. 20 gauge Sheet Steel (aprox 12"x12")
103. Assorted Spring Stock (Flat and Round) Brownells
104. 2 Pre contoured barrels (un-threaded and un-chambered)
105. 1 un-contoured barrel blank
106. A Semi-inletted wood stock for a bolt action rifle of your choice
107. Foam-Filled Fiberglass stock for a bolt action rifle of your choice
108. Cold Rolled Round stock Steel (10' Lengths):
109. 1/2", 3/4", 1", 1 1/4"
110. Flat Bar Stocks 27" length of 1"x2"
111. Flat Bar Stocks 24" length of 1/2"x1-1/2"
112. Aluminum Bar Stock (1 piece of each dimension below)
113. 1"x3"x6"
114. 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. 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: 11/05/2024