

# Lassen Community College Course Outline

## GSS-98.09 Color Case Hardening

1.0 Unit

### I. Catalog Description

This course is designed to present the old methods of color case hardening. This will include learning how to fabricate a furnace with commonly found materials. This course requires an additional fee of \$19 to cover the costs of course handouts, charcoal, blocking and shielding materials, and various color compounds.

Does Not Transfer to UC/CSU  
4 Hours Lecture, 44 Hours Lab  
Scheduled:

### II. Coding Information

Repeatability: Take 1 Time  
Grading Option: Pass/No Pass  
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:

Properly identify and prepare suitable gun parts for color case hardening and get some color on those parts.

#### B. Course Objectives

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

1. Prepare crucibles, ovens and quench tanks for color case hardening.
2. Describe and determine what gunmetals are inappropriate for the color case hardening process.
3. Describe and demonstrate the proper methods of preparing firearms for color case hardening.

### IV. Course Content

- A. Cleaning and texturizing metal
  1. Surface finish
  2. Oxidation
- B. Needs and construction
  1. Crucibles
  2. Ovens
  3. Quench tanks
- C. The annealing process
- D. Color case hardening process
  1. Temperate sensitivity
  2. Carburizing
  3. Sub-critical phase
  4. Quenching
- E. After baths

1. Clean up
2. Chemical preservatives

## **V. Assignments**

### **A. Appropriate Readings**

Trade manuals, instructor handouts, manufacturer's instructions.

### **B. Writing Assignments**

The student is required to keep a journal of written notes.

### **C. Expected Outside Assignments**

None

### **D. Specific Assignments That Demonstrate Critical Thinking**

Design and fabrication of fixtures beneficial to color case hardening techniques, analysis of color achieved on a given gunmetal.

## **VI. Methods of Evaluation**

Evaluation will be based on student's progress 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

Lecture, demonstration and laboratory practice.

## **VIII. Representative Texts and Supplies**

Handouts relevant to the topic

Trade manuals

AGI Professional Series

## **IX. Discipline/s Assignment**

Gunsmithing

## **X. Course Status**

Current Status: Active

Original Approval Date: 4/16/2001

Revised By: John Martin

Curriculum/Academic Standards Committee Revision Date: 10/16/2018