**MARSHALL UNIVERSITY**

**FORENSIC SCIENCE PROGRAM**

**FSC 640: Firearms & Toolmarks**

**PROFESSOR:** Catherine Rushton, EdD **OFFICE HRS:** posted on office door

**DAY:** Mondays **FACULTY OFFICE:** MUFSC

**TIME:**  12 – 1 pm **EMAIL:** rushton1@marshall.edu

**LOCATION:** WW 2 Classroom **CELL** **PHONE:** 304-633-2777

**SEMESTER:** Fall 2018 **DESK PHONE:**  304-691-8968

**Course Description:**

This course provides an enhanced learning experience designed to reduce the time to competency typical of the knowledge required component of a firearms examiner training program. FSC 640 is the first of two firearms and toolmarks examiner training courses.

**Required eLearning Program:** <https://firearms-examiner.training.nij.gov/>

**Required Reading:** <https://afte.org/about-us/code-of-ethics>

**Recommended Websites:** [www.afte.org](http://www.afte.org); [www.firearmsid.com](http://www.firearmsid.com); [www.swggun.org](http://www.swggun.org); [www.nra.org](http://www.nra.org)

**Course Structure:** online modules with biweekly quizzes

**Assessment Plan:** Worksheets, quizzes, and final exam

**Course Objectives:**

1. Identify benefits for having access to a nationally recognized on-line training, as well as completing this firearms examiner training program. (Module 1: Introduction)

2. Discuss safety rules and procedures essential to the firearms examiner trainee. (Safety Module)

3. Explain how today’s technology is connected to the past while tracing significant milestones in the areas of propellants, firearms, and ammunition development. (Module 3: Propellant, Firearms, and Ammunition Development)

4. Describe fabrication of metal components of firearms using common manufacturing technologies; methods used for making barrels, rifling processes, effect rifling has on bullets, the contouring and crowning process; main components of a firearm, parts known to produce identifiable marks used in firearms identification; and firearm finishing and testing process. (Module 4: Modern Firearms Manufacture)

5. Describe the historical development of propellants (both single and double based); components of ammunition; bullet jacket types and materials; steps in the ammunition assembly process; steps in ballistic testing; steps in the shotshell assembly process; reloading process and how it can be used for firearm identification. (Module 5: Small Arms Ammunition)

6. Identify the following manufacturing methods: a) Projectile manufacture methods b) Jacket manufacture technologies c) Cartridge case manufacture d) Shotshell manufacture process e) Primer manufacture process including rimfire and centerfire cartridges (Module 5: Small Arms Ammunition)

7. Define and give 3 examples: a) Physical evidence b) Biological evidence c) Drug evidence d) Other evidence not listed above e) Class characteristics f) Individual characteristics g) Associative evidence h) Corroborative evidence i) Circumstantial evidence (Module 6: Evidence Handling Procedures)

8. Describe: a) Elements of a letter of transmittal b) Chain-of-custody procedures for evidence handling within labs c) Two methods of case assignment d) Basic requirements of limited and controlled evidence access e) Lab procedures for handling trace evidence commonly associated with firearm/toolmark-related evidence (Module 6: Evidence Handling Procedures)

9. Describe: a) Lab safety concerns as they relate to evidence handling b) Process of evidence receipt in labs c) Benefits of computer-based lab information management systems (LIMS) d) Options for centralized versus decentralized evidence storage in forensic labs e) Additional considerations for types of evidence having high intrinsic value (Module 6: Evidence Handling Procedures)

10. Define: a) Standards b) Accuracy c) NIST traceability d) Measurements e) Laboratory accreditation f) Laboratory protocols g) Quality Assurance Guidelines set by AFTE and SWGGUN h) AFTE i) SWGGUN j) Measurement equipment for weight and force k) Various types of equipment for measuring dimensions l) Requirements for an indoor range, bullet recovery system, outdoor range m) Ethics and professional responsibilities of a firearms/toolmarks analyst (Module 7: Equipment and Instrumentation)

11. Describe: a) Use of a chronograph b) Stereo microscope c) Comparison microscope d) Tools and supplies at the laboratory bench e) Imaging systems f) Equipment for lab field support in crime scenes g) Integrated Ballistics Identification System (IBIS) h) MatchPoint Plus i) BulletTRAX-3d System (Module 7: Equipment and Instrumentation)

12. Explain: a) Cycle of fire for manufactured firearms b) Evidence documentation required prior to the examination c) Type, caliber, action, and safety features of firearms based on visual examination d) How to conduct a safety and functionality examination of a firearm e) How a firearm functions, its capabilities and limitations f) Safety features of firearms, how they function g) How safety features of firearms are determined to be nonfunctional h) Methods of test firing a firearm including full automatic, single-action, and double-action type firearms i) How to perform a drop test (Module 8: Examination of Firearms)

**Grading Policy:** Worksheets 40%

Quizzes 45%

Final Exam 15%

Your grade in this course is based on completed module worksheets (40%), quizzes (45%), and final exam (15%). Completed module worksheets must be emailed to Dr. Rushton by Dec 3, at 11:59 pm. All quizzes must be completed by Dec. 3, at 3pm. The final exam, if not already completed will be given on Dec 10. A suggested schedule for module completion and quiz dates is provided in the syllabus. However, you may work at your own pace. Quizzes may be taken by scheduling a time with Tiffany or Connie. More than one quiz may be taken at a time.

**Grading Scale:** A = 90-100%

B = 80-89%

C = 70-79%

D = 60-69%

F = 59-0%

**University Policies:** By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to [www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs) and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to <http://www.marshall.edu/academic-affairs/?page_id=802>

Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

**FSC 640 FIREARMS & TOOLMARKS 2018**

\* Suggested schedule \*

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| **DATE** | **TOPIC** |
| Aug 20 | Module 1: introduction  Module 15: Safety |
| Aug 27 | Quiz on Module 15: Safety Module |
| Sep 3 | Labor Day |
| Sep 10 | Module 3: Propellant, Firearms & Ammunition Development |
| Sep 17 | Quiz on Module 3 |
| Sep 24 | Module 4: Modern Firearms Manufacture |
| Oct 1 | Quiz on Module 4 |
| Oct 8 | Module 5: Small Arms Ammunition |
| Oct 15 | Quiz on Module 5 |
| Oct 22 | Module 6: Evidence Handling Procedures |
| Oct 29 | Quiz on Module 6 |
| Nov 5 | Module 7: Equipment and Instrumentation |
| Nov 12 | Quiz on Module 7 |
| Nov 19 | Thanksgiving Break |
| Nov 26 | Module 8: Examination of Firearms |
| Dec 3 | Quiz on Module 8 |
| Dec 10 | Final Exam |