

## Forensic Science 20 – Distance Education

### GENERAL INFORMATION

- i. Forensic Science 20 – 2018/2019
- ii. Instructor – Rene Cannon
- iii. Contact Information
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### COURSE DESCRIPTION

- i. The goal of Forensic Science 20 is to enable students to gain an overview of the Forensics and how it is used today to assist in the solving of crimes or during investigations. This course will provide students with an overview of the basic elements involved in the science of forensics with a view to career path and choices that may be associated with this field of study.
- ii. Prerequisite – N/A

### STUDENT LEARNING OUTCOMES

Learning Outcomes/Areas of Study from the Forensic Science 20 Curriculum include:

#### **UNIT ONE: Introduction to Forensic Science**

- Identify the definition of Forensic Science
- Investigate the history of Forensic Science

#### **UNIT TWO: Types of Evidence and Fingerprint Analysis**

Identify and classify types of physical evidence and fingerprints and determine their role in a criminal investigation

- Identify two types of physical evidence and provide examples of each.
- Categorize types of fingerprints and explain the cause of fingerprint patterns.
- Investigate various techniques to enhance fingerprints that are both visible and not visible to the human eye.
- Analyze and critique historical and/or fictional criminal case studies.

#### **UNIT THREE: Trace Evidence and Blood**

Understand the role of collecting and analyzing trace evidence during a criminal investigation

- Distinguish between the techniques of collecting trace evidence from crime scenes.
- Examine the unique properties of human and animal hairs through microscopic investigation.
- Investigate the various classifications of fibre evidence.
- Identify the basic physical, chemical and biological characteristics of blood.
- Analyze the various techniques for enhancing latent blood stains.
- Identify the basic blood spatter patterns and how they occur.
- Design and generate an original case study involving a piece of trace evidence.
- Examine the structure and function of DNA and the scientific techniques used to analyze it.

#### **UNIT FOUR: Criminal Profiling**

Understand the steps and importance of creating both criminal and geographical profiles during a criminal investigation.

Explore the psychological characteristics of serial killers and other offenders and make a connection to their crimes

- Identify the steps involved in the creation of a criminal profile.
- Recognize and describe the behavioural and personality characteristics found in criminal profiles.
- Analyze cases where criminal profiling was a prominent tool during investigation.
- Distinguish between organized and disorganized offenders.
- Identify notorious serial killers and make connections between their crimes and their personalities.
- Describe geographic profiling and how this technique was developed in Canada

### **UNIT FIVE: Law Enforcement Protective Equipment and Police Canines**

Understand the importance of job safety to law enforcers (including police officers and canines)

Understand the function of protective equipment used by law enforcers and the effects it has on the user and/or target(s).

- Examine and explain the properties of bullet-resistant vests and Conducted Energy Devices (CED's) and how they protect the lives of law enforcement officers
- Describe and understand the molecular and physical traits, practical uses, and physiological effects of equipment such as Kevlar, pepper spray, and tear gas.
- Explain how police canines are trained and used in various areas of law enforcement
- Explore and analyze the details of historical case studies that involve law enforcement safety equipment and/or police canines

### **UNIT SIX: Arson and Explosives**

Examine the severity of arson and explosive damage and the obstacles involved with an arson or explosive criminal investigation

- Describe the chemistry of combustion including types of fuels and accelerants.
- Distinguish between combustion and an explosion.
- Identify various motives for arson and explosion crimes.
- Describe and recognize various methods used to investigate arson fires and detect explosives.
- Identify types of explosives and various detonation techniques and understand the functions of each.
- Compare and contrast motives of historical arsonists and/or bombers and show psychological connections among them

### **UNIT SEVEN: Forensic Ballistics**

Examine the physics involved with firearms including firing mechanisms, trajectories, and variations of barrel types.

Understand the role of forensic ballistics in strengthening a case.

- Classify types of firearms by their make, unique velocity, kinetic energy, and trajectory capabilities.
- Identify the parts of various firearms and bullet cartridges.
- Examine the distinct properties within gun barrels and the physics behind firing a bullet.
- Explore the importance of technology in ballistic fingerprinting.
- Explain the various chemical tests and technologies used by forensic scientists to detect gunshot residue

### **TEACHING STRATEGIES**

- i. Forensic Science 20 will be a digital, project-based course delivered through Moodle. While you will be able to work on this course at whatever time suits you, there will be a suggested set of deadlines in order to help you succeed in completing the course within the given semester. Projects may include, but will not be limited to:
  - a. Discussion Forums, On-line Presentations, Research Projects
- ii. Sample deadlines
  - a. Semester One
    - September 4 - September 13: Unit One: Introduction
    - September 14 - September 30: Unit Two: Types of Evidence and Fingerprint Analysis
    - October 1 – October 27: Unit Three: Trace Evidence and Blood
    - October 30 - November 17: Unit Four: Criminal Profiling
    - November 20 - December 1: Unit Five: Law Enforcement Protective Equipment
    - December 4 - January 7: Unit Six: Arson and Explosives and Unit Seven: Forensic Ballistics
    - January 8 - January 19: Final Project
  - b. Semester Two
    - February 1 – February 9: Unit One: Introduction
    - February 12 - February 26: Unit Two: Types of Evidence and Fingerprint Analysis
    - February 27 - March 23: Unit Three: Trace Evidence and Blood
    - March 26 - April 20: Unit Four: Criminal Profiling
    - April 23 - May 18: Unit Five: Law Enforcement Protective Equipment
    - May 22 - June 1: Unit Six: Arson and Explosives and Unit Seven: Forensic Ballistics
    - June 4 - 14: Final Project

- iii. The goals of the Forensic Science 20 curriculum are to:
- a. understanding of the science behind Forensics, including real-life examples of its application in the solving of crimes
  - b. awareness of the variety of techniques and technologies employed during a criminal investigation
  - c. teamwork and relationship skills, required in the area of forensics, particularly during an investigation
  - d. opportunities to explore potential career options in the area of forensics
  - e. problem-solving and critical thinking skills when analyzing cases and potential evidence

### **COURSE MATERIALS**

- i. Any readings will be provided by the instructor through Moodle (either in print or audio version)
- ii. Any projects requiring multimedia presentations or tools can be created using whatever software/equipment is available at your home or school. The instructor and students will work together to ensure that all assignments can be completed using what is available.

### **EVALUATION:**

Learning outcomes for Forensic Science 20 are divided within the main units/modules and will be assessed in the following way throughout the course:

#### **Major Module Assignments and Projects – 50%**

- In the different units, there will be assignments or projects that will take more time and research to complete; these will be posted as major assignments. A specific marking rubric or breakdown will be provided on each assignment page. Assignments in this category will come at the end of a module as summative evaluation. These assignments will ask you to demonstrate your understanding of several skills and ideas.

#### **Portfolio of Classwork – 40%**

- Many of the lessons will have assignments to check for understanding of key concepts and ideas. These assignments will be smaller and take less time than the Unit Projects. Assignments in this category will come throughout a module and will be used to check for understanding for formative assessment purposes.

#### **Student Responses – 10%**

- Periodically, I will post links, articles, questions for you to discuss with other members of the class. Alternatively, you may be asked to select an article and pose a question for your classmates to answer. These activities will be assessed out of ten, based on your responses to the prompts provided.

There will not be a final exam in this course. On the final page of this syllabus, you may view a sample rubric that will be used for assessment.

## Holistic Scoring Guide

**Insightful:** Assignment/response is insightful and sophisticated and demonstrates confident control of language. Assignment expectations are exceeded on one or more levels. The assignment/response astutely conveys the message and achieves the purpose for the intended audience. The assignment/response is well-crafted, fully developed, well organized, can coherent. Sentences are varied and polished. The few errors are likely the result of risk-taking.

**Thoughtful:** Assignment/response is thoughtful and clear and demonstrates effective control of language. The assignment/response clearly conveys the message and achieves the purpose for the intended audience. The assignment/response is fully developed, logical, organized, and coherent. Sentences are varied and correct. The few errors do not impede communication.

**Straightforward:** Assignment/response is straightforward and predictable and demonstrates adequate control of language. The assignment/response clearly and predictably conveys the message to achieve the purpose and demonstrates some awareness of the intended audience. The assignment/response is adequately developed with sufficient, but formulaic organization. Common sentence constructions are correct but show little variety. Minor errors, though noticeable, do not impede understanding.

**Adequate:** Assignment/response is adequate and demonstrates rudimentary control of language. The assignment/response conveys a recognizable message in a simple way and neither consistently achieves purpose nor consistently demonstrates awareness of the intended audience. The assignment/response is understandable but would benefit from more development. Common and simple constructions are generally correct but show little variety. Some errors impede understanding.

**Limited:** Assignment/response is limited and demonstrates uneven control of language. The assignment/response conveys a limited, over-generalized message that addresses only a portion of the prompt and does not achieve the purpose. The assignment/response demonstrates limited awareness of the intended audience. The assignment/response demonstrates less than adequate planning. Common and simple sentence constructions demonstrate some control, but attempts at variety result in awkwardness and obscured meaning. Frequent errors impede understanding.

**Unclear:** Assignment/response is unclear and unfocused and demonstrates little to no control of language. The assignment/response is unfocused and unclear. The assignment/response demonstrates no awareness of the intended audience. The assignment/response does not show evidence of planning, and it is difficult to determine main ideas. Sentences are incomplete, run-on, and/or simple in structure. Many errors obstruct and prevent understanding.

**Not scorable:** Assignment/response is too short to warrant a mark.