



Board/Authority Authorized Course Application

School District/Independent School Authority Name: Cariboo-Chilcotin School District	School District/Independent School Authority Number (e.g. SD43, Authority#432): SD 27
Developed by: Cordell Wiebe	Date Developed: May 2019
School Name: Graduation Routes Other Ways (GROW)	Principal's Name: Curt Levens
Superintendent Approval Date (for School Districts only): <i>June 25, 2019</i>	Superintendent Signature (for School Districts only):
Board/Authority Approval Date: <i>June 25, 2019</i>	Board/Authority Chair Signature:
Course Name: BA Social Sciences 12 A (Forensic Science) / YSSC 2A	Grade Level of Course: 12
Number of Course Credits: 4	Number of Hours of Instruction: 120

Board/Authority Prerequisite(s):

None

Special Training, Facilities or Equipment Required:

Internet and computer access

Course Synopsis:

Fingerprints. Blood spatter. DNA analysis. The world of law enforcement is increasingly making use of the techniques and knowledge from the sciences to better understand the crimes that are committed and to catch those individuals responsible for the crimes.

Forensic science applies scientific knowledge to the criminal justice system. This course focuses on some of the techniques and practices used by forensic scientists during a crime scene investigation (CSI). Starting with how clues and data are recorded and preserved, the student will follow evidence trails until the CSI goes to trial, examining how various elements of the crime scene are analyzed and processed.

Goals and Rationale:

The rationale for this course has three components and will address an ongoing need we have in SD 27 Cariboo-Chilcotin Distributed Learning (The GROW Centre), supporting the needs of our high school learners in our district.

- The first piece is to support our students who are not sure about the direction they want to pursue in relation to addressing their graduation requirements while allowing them to develop their skills and explore their passions and interests as outlined in the new curriculum. Providing other options for academic and career exploration electives increases our number of elective offerings and allows students to pursue an areas of focus based on their educational goals and graduation requirements.
- The second piece is that our students are often looking for electives to take particularly in areas they are interested in. This course would fill that gap and address an emerging need we are seeing in our high schools in the district. Through our course selection meetings, we are seeing an increase in number of students who are interested exploring fields that have been historically relegated to post-secondary education. In addition, through our grad transitions interviews we are seeing an increase in number of students who are interested in pursuing careers in a list of ever expanding fields. As an elective course, students would be able to learn about a topic related to those academic and career fields. Further to that, as more and more Distributed Learning schools throughout the province offer a wider variety of courses, our students have increasingly more course options available. Students are able to enroll and take courses at any Distributed Learning course in the province. Our intent at The GROW Centre is to be responsive to and supportive of the learning needs of our students in our district. At this time, this course addresses an emerging need.
- Finally, this course is designed to give students who may be interested in forensic science an overview to the content. Currently, the BC Ministry of Education does not offer a Forensic Science courses to students. Students will be introduced to the field of forensics looking how forensic scientists analyze evidence for information about crimes and learning more about what information can be gained from human remains, physical evidence, and burned materials. They will examine how forensic scientists recognize and preserve physical evidence, and how they investigate crime scenes. Students who are interested in career in forensic sciences, or other related fields would be ideal candidates for this course

Aboriginal Worldviews and Perspectives:

Learning within BA Social Science 12A (Forensic Science) inherently acknowledges and addresses many aspects within **The First Peoples Principles of Learning**.

- Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.
- Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).
- Learning involves recognizing the consequences of one's actions.
- Learning involves generational roles and responsibilities.
- Learning recognizes the role of indigenous knowledge.
- Learning is embedded in memory, history, and story.
- Learning involves patience and time.
- Learning requires exploration of one's identity.
- Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.

BIG IDEAS

Investigate how forensic scientists analyze evidence for information about crimes

Information can be gained from human remains, physical evidence, and burned materials

Examine how forensic scientists recognize and preserve physical evidence

Explore how forensic scientists investigate crime scenes

Learning Standards

Curricular Competencies

Students are expected to do the following:

Demonstrate, practice, and enhance the curricular competencies throughout the course. These competencies involve the following:

- **Communication** -The communication competency encompasses the set of abilities that students use to impart and exchange information, experiences and ideas, to explore the world around them, and to understand and effectively engage in the use of digital media
- **Thinking** - The thinking competency encompasses the knowledge, skills and processes we associate with intellectual development. It is through their competency as thinkers that students take subject-specific concepts and content and transform them into a new understanding. Thinking competence includes specific thinking skills as well as habits of mind, and metacognitive awareness.
- **Personal and Social** - Personal and social competency is the set of abilities that relate to students' identity in the world, both as individuals and as members of their community and society. Personal and social competency encompasses the abilities students need to thrive as individuals, to understand and care about themselves and others, and to find and achieve their purposes in the world.

Content

Students are expected to know the following:

- **responsibilities** of forensic scientists and some of the speciality areas that forensic scientists may work in
- different types of **crime scene evidence** and how it may best be handled
- **physical evidence**
- how forensic scientists make use of the **forensic autopsy** to gain more information about a probable cause of death and **mechanism of death**
- how biological evidence is preserved for DNA testing
- how evidence is collected and preserved at **arson** scenes
- the different types of **explosives** and how explosive materials are collected and preserved
- identification processes for **illegal drugs** present at a crime scene, and how they may have been involved in different crimes.

Students are expected to approach these competencies in this course in the following manner:

Questioning and predicting

- Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal, local, or global interest
- Make observations aimed at identifying their own questions, including increasingly abstract ones, about the natural world
- Formulate multiple hypotheses and predict multiple outcomes

Planning and conducting

- Plan, select, and use appropriate investigation methods, including field work and lab experiments, to collect reliable data (qualitative and quantitative)
- Assess risks and address ethical, cultural, and/or environmental issues associated with their proposed methods
- Use appropriate equipment, including digital technologies, to systematically and accurately collect and record data

Processing and analyzing data and information

- Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information
- Seek and analyze patterns, trends, and connections in data, including describing relationships between variables, performing calculations, and identifying inconsistencies
- Construct, analyze, and interpret graphs, models, and/or diagrams
- Use knowledge of scientific concepts to draw conclusions that are consistent with evidence
- Analyze cause-and-effect relationships

Evaluating

- Describe specific ways to improve their investigation methods and the quality of their data
- Evaluate the validity and limitations of a model or analogy in relation to the phenomenon modelled
- Demonstrate an awareness of assumptions, question information given, and identify bias in their own work and in primary and secondary sources

- aspects that **document** examiners look for in comparing documents and techniques used to find alterations in documents
- how forensic scientists test for and identify **poisonous substances**
- **trace forms of evidence**
- **forensic entomology**
- **forensic anthropology** (including **Osteology Dentition** and **Ethnobotany**)
- **facial reconstruction**
- **digital evidence**

- Consider the changes in knowledge over time as tools and technologies have developed for forensic scientists
- Connect scientific explorations to careers in science
- Exercise a healthy, informed skepticism and use scientific knowledge and findings to form their own investigations to evaluate claims in primary and secondary sources
- Consider social, ethical, and environmental implications of the findings from their own and others' investigations
- Critically analyze the validity of information in primary and secondary sources and evaluate the approaches used to solve problems

Applying and innovating

- Design projects with local and/or global connections and applications
- Contribute to finding solutions to problems at a local and/or global level through inquiry
- Implement multiple strategies to solve problems in real-life, applied, and conceptual situations
- Consider the role of scientists in innovation and advancement in the study of forensics

Communicating

- Use social studies inquiry processes and skills to ask questions; gather, interpret, and analyze legal concepts, issues, and procedures; and communicate findings and decisions
- Formulate physical or mental theoretical models to describe a phenomenon
- Communicate scientific ideas and information, and perhaps a suggested course of action, for a specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language, conventions, and representations

Big Ideas – Elaborations

Investigate how forensic scientists analyze evidence for information about crimes.

Sample questions to support inquiry with students:

- What are the different examples of physical evidence?
- How do bugs and bones assist in solving crimes?
- What are the differences between individual and class characteristics and what do they mean for crime investigations?

Information can be gained from human remains, physical evidence, and burned materials.

Sample questions to support inquiry with students:

- How do forensic scientists establish a time of death?
- What information can be gained from skeletal remains?
- What challenges are presented for evidence analysis from arson and explosion crime scenes?

Examine how forensic scientists recognize and preserve physical evidence.

Sample questions to support inquiry with students:

- How are crime scenes preserved?
- How do forensic scientists recognize which evidence has potential for solving a crime?

Explore how forensic scientists investigate crime scenes.

Sample questions to support inquiry with students:

- How secure are crime scenes?
- How is crime scene evidence collected and recorded?

Curricular Competencies – Elaborations

• Questioning and predicting:

Sample opportunities to support student inquiry:

- What are some current limitations of forensic science investigations, and how could they be addressed in the future?
- Based on decomposition rates, how accurate can predictions be regarding approximate time of death?
- What advancements in forensics will be developed in the future and how will they build on current practices?
- What can comparisons between fiber and paint evidence and known samples tell forensic scientists?

• Planning and conducting:

Sample opportunities to support student inquiry:

- Record how impressions, like footprints and tire tracks, are collected and analyzed.
- Record qualitative and quantitative evidence from a crime scene in order to reach an informed hypothesis on the crime scene.
- Determine how investigators can estimate the distance between a gun and a shooting victim.

• **Processing and analyzing data and information:**

Sample opportunities to support student inquiry:

- Give informed time of death estimates from forensic evidence
- How does DNA evidence differ between individuals and ethnic groups?
- What information can be gained from skeletal remains?
- Examine how fingerprints are discovered and collected at a crime scene and the analysis of the fingerprints in a crime lab
- Classify bullets fired from a gun by their unique markings and striations
- what can forensic scientists learn from a forensic autopsy

• **Evaluating:**

Sample opportunities to support student inquiry:

- How is biological evidence best preserved for DNA testing?
- Evaluate the effectiveness of methods used to test for explosive materials at crime scenes
- Investigate glass fragments and soil as physical evidence and what they can tell forensic scientists about a crime

• **Applying and innovating:**

Sample opportunities to support student inquiry:

- Consider the relationship between forensic science and the criminal justice system and its strengths and weaknesses.
- Investigate how stains are tested to determine if they are blood and if they are human blood.
- Determine how the characteristics of bones and teeth that provide forensic scientists with information about the person.

• **Communicating:**

Sample opportunities to support student inquiry:

- Explain how and why evidence needs to be collected carefully and within legal guidelines.
- Elucidate on how investigators determine where a fire started and whether accelerants were used
- Explain how you can differentiate between facts and theories

Content – Elaborations

- **responsibilities:**
 - Verification for secured scenes
 - Evidence collection
 - Confirming custodial chain of command for evidence
 - Relationship between forensic scientist and criminal justice system
- **crime scene evidence:**
 - Proper search techniques
 - Securing evidence
 - Recording evidence
 - Proper collection and packing techniques that meet legal guidelines
- **physical evidence:**
 - Physical (hair, fingerprints, blood) and chemical (blood, DNA) properties
 - Glass fragments
 - Soil
 - Impressions
 - Firearms
 - Tool marks
- **forensic autopsy:** series of tests and examinations performed on the body to determine the presence of an injury that may have caused or contributed to the death
- **mechanism of death:** injury that initiates a chain of events, brief or prolonged, which produces a fatal outcome
- **arson:**
 - Examine for accelerants
 - Determine origin of fire
- **explosives:**
 - Collection of explosive remnant evidence
 - Preservation and testing
- **illegal drugs:**
 - Testing from samples
 - Collecting and preserving drug evidence
- **document:** any written evidence that may be compromised for criminal purposes
- **poisonous substances:**
 - Forensic toxicology
 - Arsenic, cyanide, strychnine, carbon monoxide, aconite, ricin

Content – Elaborations

- **trace forms of evidence:** paint soil and fibres
- **forensic entomology:** the study of insects, including insect behavior, as it relates to crime
- **forensic anthropology:** the study of human bones in relation to criminal investigations
- **Osteology:** the study of bones
- **Dentition:** the study of teeth and teeth remains
- **Ethnobotany:** the study of plant remains and pollens
- **facial reconstruction:** a method used in the forensic field when a crime involves unidentified remains; it is usually performed by a sculptor who is an expert in facial anatomy
- **digital evidence:**
 - evidence gathered from computer hardware and software
 - web-based information as evidence

Recommended Instructional Components:

The instructional component of this course is delivered and completed online. The content for the course is included within the online course and students are self-guided through the lessons. Support is provided through The GROW Centre if students have questions about the assessments. Students will be met with on a regular basis to review their progress in the course.

Recommended Assessment Components:

The course will be marked in accordance with the Principles of Quality Assessment Guidelines and the Reporting Policies set out by the Ministry of Education. The course is completed in 16 units of work.

The distribution of grades for the course is broken down as follows:

16 Units (unit questions, labs, and discussion questions)	50%
16 Unit Quizzes	30%
4 Module Exams	20%
Total	100%

The course syllabus indicates “homework” as being part of the student’s marks. The “homework” will be renamed as “Assignment Text Questions” and “Lab Questions” in the online course and will be counted towards the unit grade for the students. Feedback will be provided to the students from the teacher.

The Lab Questions for the course are part of a web journey lab that the students will have to complete for each unit. Each lab relates to a series of questions that are developed as a result of a web based video series or web based exploration that they complete. Within each lab are links to educational material developed by various organizations around the globe. The labs are directly related the unit content and lead the students through a series of inquiries and questions. The labs are very interactive and add an additional element to the online learning environment.

The discussion questions are part of an online forum associated with the course where the students are required to answer questions posted on the forum. The intent behind the discussion questions is to illicit conversation that would normally come in a face-to-face delivery of the course.

There is a full teacher guide provided for the course with detailed responses to the assessments in the course. This resource is available to the teacher who marks the course. The online quizzes that have selected response components to them are auto corrected and immediate feedback is provided to the students upon completion of the assessment.

Learning Resources:

The course content and assessments are provided through eDynamic Learning. SD27 Distributed Learning has a contract with eDynamic to provide course content for some of our online courses. Through eDynamic Learning we have the opportunity to offer many courses using this format.