

# Minnesota State College Southeast

## CHEM 1225: Introduction to Forensic Science

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 2

Lab Hours/Week: 2

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: Goal 03 - Natural Science, Goal 09 - Ethical/Civic Resp

This chemistry course will explore the scientific basis and background for crime-scene investigations. Students will explore the entire field of forensic science, including the different kinds of physical evidence, collection, preservation, and proper analysis of evidence, current technologies and techniques used to examine evidence, interpretation of results from a variety of forensic-laboratory analyses, and the ethical implications of using forensic data in a case. Students will perform several laboratory experiments to learn some data analysis techniques. (Meets MnTC Goals 3 & 9) (Prerequisite: none) (3 credits: 2 lecture/1 lab)

**B. COURSE EFFECTIVE DATES:** 07/20/2016 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Basic concepts in general, organic and biochemistry with emphasis on their relationship to the basic principles of forensic science
2. The scientific method, proper collection, analysis, and interpretation of data
3. The collection and analysis and uses of forensic data in our criminal justice system
4. The scientific basis for analyses, methods, and tests most frequently used in forensic science laboratories
5. Safe laboratory techniques

#### **D. LEARNING OUTCOMES (General)**

1. Differentiate and identify elements, compounds and mixtures at the microscopic and macroscopic level
2. Differentiate between chemical and physical changes and properties
3. Understand the changes in energy involved in chemical reactions
4. Become adept at measurements in the US and metric system and convert between these measurement systems
5. Determine the subatomic particles of a given atom, ion or isotope from the periodic table
6. Identify, classify and name common ionic and covalent compounds
7. Balance, identify and predict products for common chemical reactions, including acid/base reactions
8. Relate chemical reactions to arson, drug synthesis and explosions
9. Identify and classify organic and biochemical compounds commonly encountered in forensic science
10. Perform fingerprinting, biological fluid and tool marking analysis
11. Demonstrate competence in microscope analysis and understand DNA footprinting
12. Observe, document and draw conclusions from experimental results that would be generated in forensics science laboratories
13. Utilize the scientific method when performing experiments, while observing safe handling of laboratory chemicals and glassware

#### **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

##### Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

##### Goal 09 - Ethical/Civic Resp

1. Examine, articulate, and apply their own ethical views.
2. Understand and apply core concepts (e.g. politics, rights and obligations, justice, liberty) to specific issues.
3. Recognize the diversity of political motivations and interests of others.

#### **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

#### **G. SPECIAL INFORMATION**

This course was previously CHEM 2525.