CHEMISTRY 5104
Topics in Chemistry:
Lab Safety and Responsible Conduct of Research
Fall, 2019

Course Syllabus

General Information

Course Information:

Meeting Time/Place: CHEM 234/Wed., 9:00 – 9:50
Instructor: Dr. Dominick Casadonte
Office: Chemistry 226 A
Phone No.: 834-2746
E-mail: Dominick.Casadonte@ttu.edu
Office Hours: 4:00 – 5:00 M, T, or by appointment (through e-mail)
Textbook (First Half):
“Introduction to Laboratory Safety”
Dominick Casadonte (excerpted from “Laboratory Safety for Chemistry Students”, Robert H. Hill, Jr., David C. Finster)
http://store.vitalsource.com/show/9781119097235 (e-book)

(Second Half):
Although there is no textbook, some of the information will be taken from “RCR Scholarly Messenger” Articles, written by Marianne Evola. The website is http://www.depts.ttu.edu/vpr/integrity/RCR/sm-articles.php

Course Overview

This course is designed with two outcomes in mind. The first is to begin a discussion of basic laboratory safety concepts and practices in both research and teaching laboratories. The idea is not simply to discuss chemical laboratory safety, however. Concept mastery will be assessed through exams and quizzes. The practice of laboratory safety will be implemented through practical, laboratory-based homework exercises. The second half of the course will focus on issues related to the responsible conduct of research. Again, the intent is to provide practical information that can be used in actual laboratory, research, and/or discovery settings. When possible, information for both portions of the course will come from primary sources as well as actual and fictitious case studies.
Expected Learning Outcomes for CHEM 5104-001

After completing this course, the fully successful student will be able to:

- Indicate the characteristics of a culture of safety in both industrial and academic settings
- Identify and use primary resources and references concerning chemical safety
- Use the Globally Harmonized System (GHS) for chemical hazard communication
- Recognize and identify different classes and types of chemical hazards
- Understand the concepts of hazard and risk and be able to perform a hazard and risk management analysis that is appropriate for the laboratory setting
- Identify and implement basic safety considerations in teaching labs
- Develop a chemical safety management plan for a research laboratory
- Articulate the differences between ethics and morality
- Discuss the role of the scientist in society
- Understand the concepts of data ownership and management as well as intellectual property
- Distinguish between the different levels and roles in authorship, publication and plagiarism
- Understand the notions of conflict of interest and experimental bias
- Discuss the role of responsible conduct in multidisciplinary research

General Outcomes Assessment

There will be three aspects to the assessment of this course:

A. Short Quizzes (100 points total): These will be given every other week, and will include material covered up to the current week of reading and assignments. Each quiz will be worth 20 points, and the lowest quiz grade will be dropped.

B. Homework (200 points total): Every other week a practical homework exercise will be given which will put into practice one or more of the concepts discussed in class. These are meant to be done in your lab or through analysis of resources, and will be applied. Each homework assignment will be worth 40 points, and the lowest homework grade will be dropped.

C. Case Studies (100 points total): Twice during the semester you will be asked to work together in teams to analyze and assess case studies and ethical situations that are designed to highlight real-world applications related to the safety/RCR topics discussed in this course. These will compliment case studies that will be presented in the course of class discussion. Each team will have a week to discuss the case study. Each team will then produce a position paper of no less than three pages and no more than five pages, double-spaced. A grading rubric will be provided for each paper. Each paper (there will be two assignments) will be graded on the basis of 50 points, for a total of 100 points.
Summary of General Outcomes Assessment

The course is graded based on the total number of points earned through the various assessment mechanisms. The table below summarizes the values for each of the assessments, as well as the grading scale.

<table>
<thead>
<tr>
<th>Outcome Assessment</th>
<th>Maximum Score</th>
<th>Grading Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>100 points</td>
<td>90-100% A</td>
</tr>
<tr>
<td>Homework</td>
<td>200 points</td>
<td>80-89.9%</td>
</tr>
<tr>
<td>Case Studies</td>
<td>100 points</td>
<td>70-79.9% C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60-69.9% D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 60% F</td>
</tr>
<tr>
<td>Total</td>
<td>400 points</td>
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Criteria for Grade Determination

The intent is to provide no curve in the course. Course grades will be determined based on the percentage of material mastered as determined by the assessments given above. The total number of points is 400. Thus, as a rough guideline, 90% (360 points) and above is expected to be an A, 80-89.9% a B, 70-79.9% a C, and 60-69.9% a D, and any overall score below 60% will receive a grade of F.

Additional Course Information

Attendance: You are expected and encouraged to attend lectures. You are responsible (even if you miss lecture) for all assignments, announcements, and course changes that are made.

Cheating: Academic dishonesty will NOT be tolerated in this course. Cheating in any form will be treated according to the rules enumerated in the 2019-2020 catalog (pg. 42-43). It is your responsibility to be familiar with these rules.

Civility in the Classroom

“Students are expected to assist in maintaining a classroom environment that is conducive to learning. To ensure that all students have the opportunity to gain from time spent in class, faculty members are encouraged to include a statement in their course syllabi relating to behavioral expectations in the classroom.” (Texas Tech University Catalog, p. 41).

Polite behavior is expected. Out of respect for your instructor as well as the other class members, please arrive on time and avoid interrupting the class by turning off all cell phones and beepers. If you must take a call, please quietly leave and return after the call.
Disability Accommodation

“The University is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all.” Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements.

Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.

Additional Attendance Statements

Absence due to religious observance: “A student shall be excused from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence.” (Texas Tech University Catalog, p. 41)

Absence due to officially approved trips: “Department chairpersons, directors, or others responsible for a student representing the university on officially approved trips should notify the student’s instructors of the departure and return schedules in advance of the trip, per OP 34.04. The instructor so notified must not penalize the student, although the student is responsible for material missed. Students absent because of university business must be given the same privileges as other students (e.g., if other students are given the choice of dropping one of four tests, then students with excused absences must be given the same privilege).” (Texas Tech University 2019-20 Catalog, p. 41).
## I. Course Outline

<table>
<thead>
<tr>
<th>Approx. Dates</th>
<th>Lecture</th>
<th>Topic</th>
<th>Chapter (ILS)</th>
<th>Assignment Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug.28</td>
<td>1</td>
<td>Developing a Culture of Safety and Basic Safety Principles</td>
<td>1.1, 1.2</td>
<td>------</td>
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<tr>
<td>Sept. 4</td>
<td>2</td>
<td>Resources and References For Chemical Safety Analysis, Management, and Communication</td>
<td>1.3.3</td>
<td>HW 1/Quiz 1 and (Handout)</td>
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<tr>
<td>Sept. 11</td>
<td>3</td>
<td>Chemical Hazard Communication</td>
<td>3</td>
<td>HW 2</td>
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<tr>
<td>Sept. 18</td>
<td>4</td>
<td>Recognizing Chemical Hazards</td>
<td>5</td>
<td>Quiz 2</td>
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<tr>
<td>Sept. 25</td>
<td>5</td>
<td>Hazard Analysis And Risk Management</td>
<td>6</td>
<td>HW 3</td>
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<tr>
<td>Oct. 2</td>
<td>6</td>
<td>Safety Considerations In Teaching Labs</td>
<td>2</td>
<td>Quiz 3</td>
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<tr>
<td>Oct. 9</td>
<td>7</td>
<td>Chemical Safety Management in the Research Lab</td>
<td>7, 8</td>
<td>HW 4</td>
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<tr>
<td>Oct. 16</td>
<td>8</td>
<td>Ethics and Morality</td>
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<td>Quiz 4</td>
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<tr>
<td>Oct. 23</td>
<td>9</td>
<td>The Role of the Scientist and Society</td>
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<td>HW 5</td>
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<tr>
<td>Oct. 30</td>
<td>10</td>
<td>Data Ownership, Management and Intellectual Property</td>
<td>-----</td>
<td>Case Study 1</td>
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<tr>
<td>Nov. 6</td>
<td>11</td>
<td>Authorship, Publication And Plagiarism</td>
<td>-----</td>
<td>Quiz 5</td>
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<tr>
<td>Nov. 13</td>
<td>12</td>
<td>Conflict of Interest and Experimental Bias</td>
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<td>HW 6</td>
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<tr>
<td>Nov. 20</td>
<td>13</td>
<td>Multidisciplinary Research</td>
<td>-----</td>
<td>Quiz 6</td>
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<tr>
<td>Dec. 4</td>
<td>14</td>
<td>Wrap Up</td>
<td>-----</td>
<td>Case Study 2</td>
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