**Course Description**

Exploration of the basic principles associated with the toxic effects of chemicals on the living organism while examining the regulatory aspects and applications of toxicology in the workplace. Among the topics covered are the potential adverse effects of drugs, pesticides, food additives, and industrial chemicals.

**Prerequisites**

MA 1150, BIO 1030, and BIO 1040 or BIO 1100

**Course Textbook**


**Course Learning Objectives**

Upon completion of this course, students should be able to:

1. Describe the history, the terminology, and the basic concepts of toxicology.
2. Explain the absorption, distribution, and excretion of chemical compounds into biological systems.
3. Summarize the metabolic fate of chemicals in biological systems and the importance to toxicity.
4. Discuss the exposure of biological systems to chemicals and the pathological consequences of that exposure.
5. Explain the characteristics of different drugs and their toxicity.
6. Illustrate the hazards of exposure to industrial chemicals with some examples.
7. Discuss the toxicology of food additives and contaminants used in our daily life.
8. Identify the toxicity of different types of pesticides.
9. Summarize the various aspects of environmental pollution and their exposures.
10. Explain the toxic effects of natural products on target organs of the body.
11. Discuss some examples of poisoning with household products and miscellaneous chemicals and treatment of poisoning.
12. Categorize the testing of chemicals for toxicity and the assessment of risk from chemicals.

**Credits**

Upon completion of this course, the students will earn three (3) hours of college credit.

**Course Structure**

1. **Unit Learning Objectives:** Each unit contains learning objectives that specify the measurable skills and knowledge students should gain upon completion of the unit.
2. **Unit Summaries:** Each unit contains an overview, or summary, of the information to be covered.
3. **Reading Assignments:** The assignments include approximately 1-4 textbook chapters in each course unit. Assigned readings are not limited to textbook chapters, but may include supplemental books, professional journals, and internet sites.
4. **Key Terms**: Key terms are intended to guide students in their course of study. Students should pay particular attention to key terms as they represent important concepts within the unit material and reading.
5. **Discussion Boards**: Discussion Boards are a part of all CSU term courses. Information and specifications regarding these assignments are provided in the Academic Policies listed in the Course Menu bar.
6. **Unit Assessments**: This course contains six unit assessments – to be completed at the end of Units I-III and V-VII. Assessments are composed of ten multiple choice questions and three written response questions.
7. **Assignments**: Information and specifications regarding these assignments are located below.
8. **Ask the Professor**: This communication forum provides you with an opportunity to ask your professor general or course content related questions.
9. **Student Break Room**: This communication forum allows for casual conversation with your classmates.

**Assignments**

**Article Critique (Unit IV)**

**Background and Instructions:**

The use of DDT has been banned in the United States because of environmental damage and human health concerns. However, in malaria-plagued countries such as Africa, the World Health Organization approves the use of DDT for indoor residual house spraying. Read the following WHO’s Position Statement, “The use of DDT in malaria vector control”.

Link to: [WHO’s Position Statement on DDT](#)

Take the position that you work for the World Health Organization, and have been tasked with re-evaluating the current policies outlined in their Position Statement. Using the instructions to guide you in your analysis, answer the following questions. Feel free to use additional information and avenues of information to critically analyze this policy.

1. How would you use a risk versus benefit assessment, and what other types of toxicology data would you need to make this decision? Refer to Chapter 12.
2. Use the four phases of the disposition of a toxic compound to assess the toxicity of DDT.
3. What types of exposure and response are associated with DDT?
4. Should the WHO continue to approve the use of DDT to combat malaria?

Your Article Critique assignment should be 3-4 pages in length. CSU requires that students use the APA style guidelines in writing course papers. Therefore, the APA rules for formatting, quoting, paraphrasing, citing, and listing of sources are to be followed.

To submit your completed Article Critique, upload it using the "Article Critique" link in Unit IV. **Do not e-mail your paper directly to your professor.** By uploading through Blackboard, your university record will automatically be updated to indicate you have submitted your paper, and it will be provided to your professor for grading.

**Case Study (Unit VIII)**

**Background and Instructions:**

In recent years, honeybee colonies have been experiencing “Colony Collapse Disorder” (CCD). Given the key role of honeybees in pollinating our agricultural crops, it has become a serious issue. Many causes for the collapse of honeybee colonies are currently being investigated. The potential causes include viruses, parasites, urban sprawl, pesticides, and other environmental pollutants. Examine the phenomenon of CCD from a toxicological standpoint by researching three groups of chemicals that are being investigated as potential contributors to CCD: Antibiotics, miticides, and neonicotinoid pesticides.

The assigned Case Study for this course deals with the phenomena of “Colony Collapse Disorder” in honeybee populations, and should include the following components:

- A brief introduction of the phenomenon.
- Background information on the groups of chemicals pertinent to the Case Study.
- Analysis of the key potential causes of the phenomena.
- Summary of the article’s conclusions and your own opinions on the potential causes for the phenomena.
Write a 4-5 page analysis (double spaced, 12 pt. type) of the potential causes listed above, and then discuss your opinion regarding which, if any, is the most likely cause. If you do not believe any of these chemicals are contributing to CCD, provide a brief discussion about what you believe to be the cause. Information resources can be gathered from the journals and articles available in our CSU Library Databases. Be sure to provide both in-text references as well as the full citations in APA format at the end of your analysis. Include a cover page and brief abstract for your analysis (these pages are not to be included in the total 4-5 page requirement). The Case Study assignment must follow APA style guidelines, therefore the APA rules for formatting, quoting, paraphrasing, citing, and listing of sources are to be followed.

The Ebsco Database (Business Source Complete) is a very good source of journals for articles related to the subject matter discussed in both assignments. Students can access the CSU Online Library resources by clicking the “My Library” link located in the Course Menu.

To submit your completed Case Study, upload it using the "View/Complete" link located in Unit VIII. **Do not e-mail your paper directly to your professor.** By uploading through Blackboard, your university record will automatically be updated to indicate you have submitted your paper, and it will be provided to your professor for grading.

### APA Guidelines

CSU requires that students use the APA style for papers and projects. Therefore, the APA rules for formatting, quoting, paraphrasing, citing, and listing of sources are to be followed. A document titled “APA Guidelines Summary” is available for you to download from the APA Guide Link, found in the Learning Resources area of the myCSU Student Portal. It may also be accessed from the Student Resources link on the Course Menu. This document provides links to several internet sites that provide comprehensive information on APA formatting, including examples and sample papers.

### CSU Grading Rubric for Papers/Projects

The course papers will be graded based on the CSU Grading Rubric for all types of papers. In addition, all papers will be submitted for electronic evaluation to rule out plagiarism. Course projects will contain project specific grading criteria defined in the project directions. To view the rubric, click the Academic Policies link on the Course Menu, or by accessing the CSU Grading Rubric link, found in the Learning Resources area of the myCSU Student Portal.

### Communication Forums

These are non-graded discussion forums that allow you to communicate with your professor and other students. Participation in these discussion forums is encouraged, but not required. You can access these forums with the buttons in the Course Menu. Instructions for subscribing/unsubscribing to these forums are provided below.

**Click here for instructions on how to subscribe/unsubscribe and post to the Communication Forums.**

### Ask the Professor

This communication forum provides you with an opportunity to ask your professor general or course content questions. Questions may focus on Blackboard locations of online course components, textbook or course content elaboration, additional guidance on assessment requirements, or general advice from other students.

Questions that are specific in nature, such as inquiries regarding assessment/assignment grades or personal accommodation requests, are NOT to be posted on this forum. If you have questions, comments, or concerns of a non-public nature, please feel free to email your professor. Responses to your post will be addressed or emailed by the professor within 48 hours.

Before posting, please ensure that you have read all relevant course documentation, including the syllabus, assessment/assignment instructions, faculty feedback, and other important information.

### Student Break Room

This communication forum allows for casual conversation with your classmates. Communication on this forum should always maintain a standard of appropriateness and respect for your fellow classmates. This forum should NOT be used to share assessment answers.
Grading

Discussion Board (8 @ 2%) = 16%
Unit Assessments (6 @ 9%) = 54%
Article Critique (Unit IV) = 15%
Case Study (Unit VIII) = 15%
Total = 100%

Course Schedule/Checklist (PLEASE PRINT)

The following pages contain a printable Course Schedule to assist you through this course. By following this schedule, you will be assured that you will complete the course within the time allotted.
By following this schedule, you will be assured that you will complete the course within the time allotted. Please keep this schedule for reference as you progress through your course.

### Unit I  Introduction and Disposition of Toxic Compounds

**Review:**
- [ ] Unit Study Guide

**Read:**
- [ ] Chapter 1: Introduction
- [ ] Chapter 2: Disposition of toxic compounds

**Discuss:**
- [ ] Discussion Board Response: Submit your response to the Discussion Board question by Saturday, Midnight (Central Time)

**Submit:**
- [ ] Assessment by Tuesday, Midnight (Central Time)

### Unit II  Metabolism of Foreign Compounds, Their Exposure and Response

**Review:**
- [ ] Unit Study Guide

**Read:**
- [ ] Chapter 3: Metabolism of foreign compounds
- [ ] Chapter 4: Types of exposure and response

**Discuss:**
- [ ] Discussion Board Response: Submit your response to the Discussion Board question by Saturday, Midnight (Central Time)
- [ ] Discussion Board Comment: Comment on another student’s Discussion Board response by Tuesday, Midnight (Central Time)

**Submit:**
- [ ] Assessment by Tuesday, Midnight (Central Time)

### Unit III  Drugs as Toxic Substances and Industrial Toxicology

**Review:**
- [ ] Unit Study Guide

**Read:**
- [ ] Chapter 5: Drugs as toxic substances
- [ ] Chapter 6: Industrial toxicology

**Discuss:**
- [ ] Discussion Board Response: Submit your response to the Discussion Board question by Saturday, Midnight (Central Time)
- [ ] Discussion Board Comment: Comment on another student’s Discussion Board response by Tuesday, Midnight (Central Time)

**Submit:**
- [ ] Assessment by Tuesday, Midnight (Central Time)
### Unit IV: Mid-Course Summary and Article Critique

**Review:**
- ☐ Unit Study Guide

**Read:**

**Discuss:**
- ☐ Discussion Board Response: Submit your response to the Discussion Board question by Saturday, Midnight (Central Time)
- ☐ Discussion Board Comment: Comment on another student’s Discussion Board response by Tuesday, Midnight (Central Time)

**Submit:**
- ☐ Article Critique by Tuesday, Midnight (Central Time)

### Notes/Goals:

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### Unit V: Food Additives, Contaminants, and Pesticides

**Review:**
- ☐ Unit Study Guide

**Read:**
- ☐ Chapter 7: Food additives and contaminants
- ☐ Chapter 8: Pesticides

**Discuss:**
- ☐ Discussion Board Response: Submit your response to the Discussion Board question by Saturday, Midnight (Central Time)
- ☐ Discussion Board Comment: Comment on another student’s Discussion Board response by Tuesday, Midnight (Central Time)

**Submit:**
- ☐ Assessment by Tuesday, Midnight (Central Time)

### Notes/Goals:

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### Unit VI: Environmental Pollutants and Natural Products

**Review:**
- ☐ Unit Study Guide

**Read:**
- ☐ Chapter 9: Environmental pollutants
- ☐ Chapter 10: Natural products

**Discuss:**
- ☐ Discussion Board Response: Submit your response to the Discussion Board question by Saturday, Midnight (Central Time)
- ☐ Discussion Board Comment: Comment on another student’s Discussion Board response by Tuesday, Midnight (Central Time)

**Submit:**
- ☐ Assessment by Tuesday, Midnight (Central Time)

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