



Course Description

Advanced understanding of toxicology in the occupational environment. Analysis of target organs, adverse health effects, and the systems/organs that are the targets of toxicants. Includes assessments of safety and risk of carcinogenic and non-carcinogenic chemicals.

Course Textbook

Kacaw, S., & Lee, B. M. (2013). *Lu's basic toxicology: Fundamentals, target organs, and risk assessment* (6th ed.). New York, NY: Informa Healthcare.

Course Learning Outcomes

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

1. Compare and discriminate between the major sub-disciplines of toxicology and their roles in occupational safety and health.
2. Illustrate the mechanisms by which a toxicant passes through the cell membrane: routes of absorption, the distribution process, and routes of excretion of a toxicant.
3. Summarize and compare three types of Phase I reactions and the most common types of Phase II reactions.
4. Classify sub-cellular sites of action, types of molecular targets, and types of receptors that are responsible for being mediators of effects of toxins.
5. Compare and discriminate the different mechanisms of action that a toxin can use and the effects of chemical interactions among toxins.
6. Compare and discriminate the differences and similarities between chemical carcinogenesis, mutagenesis, and teratogenesis.
7. Summarize toxicants in human breast milk and adverse infant effects.
8. Discriminate common examples of toxins that affect the following systems or target organs in the human body: immune, respiratory, liver, kidney, skin, eye, nervous system, reproductive, and cardiovascular.
9. Describe the major toxicological concern of food additives, food contaminants, insecticides, metals, and over-the-counter drugs on human health.
10. Summarize the toxic effects of common organic solvents, air pollutants, and water and soil pollutants.
11. Discriminate the toxic substances at workplaces and their toxic effects.
12. Explain the risk assessment procedures for non-carcinogenic and carcinogenic chemicals.

Credits

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

Course Structure

1. Unit Learning Outcomes: Each unit contains Unit Learning Outcomes that specify the measurable skills and knowledge students should gain upon completion of the unit.
2. Unit Lesson: Each unit contains a Unit Lesson, which discusses unit material.
3. Reading Assignments: Each unit contains Reading Assignments from one or more chapters from the textbook. Supplemental Readings are provided in the unit study guides to aid students in their course of study.
4. Learning Activities (Non-Graded): These non-graded Learning Activities are provided in each unit to aid students in their course of study.

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

material must have accompanying citations.
 which can be your textbook. All sources used, including your textbook, must be referenced, paraphrased and quoted members' profile. This paper should be a minimum of two pages in length. You are required to use three sources, one of exposed to a toxin, and explain how the toxicant reacts differently to each family member as it correlates to the individual nutritional status, and medications for each member of the family. Develop a scenario in which the entire family is Create an imaginary profile of a family of three to four members providing details such as sex, age, health status,

Unit II Essay

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

Prepare an eight- to ten-slide PowerPoint Presentation discussing the roles of 5-7 subdisciplines of toxicology and the connection these subdisciplines have in occupational health and safety. Be sure to cite references on your last slide in proper APA format. You may either utilize the speaker's notes feature to type the script of what you would say if you were to present the PowerPoint to your classmates or record your voice speaking within the PowerPoint Presentation.

Unit I PowerPoint Presentation

Unit Assignments

Librarians can help you develop your research plan or assist you in finding relevant, appropriate, and timely information. Reference requests can include customized keyword search strategies, links to articles, database help, and other services.
 The CSU Online Library offers several reference services. E-mail (library@columbiastate.edu) and telephone assistance is available Monday – Thursday from 8 am to 5 pm and Friday from 8 am to 3 pm. The library's chat reference service, *Ask a Librarian*, is available 24/7; look for the chat box on the online library page.
 The CSU Online Library is available to support your courses and programs. The online library includes databases, journals, e-books, and research guides. These resources are always accessible and can be reached through the library webpage. To access the library, log into the myCSU Student Portal, and click on "CSU Online Library." You can also access the CSU Online Library from the "My Library" button on the course menu for each course in Blackboard.

CSU Online Library

5. **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.
6. **Discussion Boards:** Discussion Boards are part of all CSU term courses. More information and specifications can be found in the Student Resources link listed in the Course Menu bar.
7. **Unit Assessments:** This course contains one Unit Assessment in Unit I. It is composed of a written response question.
8. **Unit Assignments:** Students are required to submit for grading Unit Assignments in Units I-VIII. Some units have multiple assignments. Specific information and instructions regarding these assignments are provided below. Grading rubrics are included with all assignments. Specific information about accessing these rubrics is provided below.
9. **Final Project:** Students are required to submit for grading a Final Project in Unit VIII. Specific information and instructions regarding this assignment are provided below. A grading rubric is included with this assignment.
10. **Final Exam (Proctored):** Students are to complete a Final Exam in Unit VIII. All Final Exams are proctored—see below for additional information. You are permitted four (4) hours to complete this exam, in the presence of your approved proctor. This is an open book exam. Only course textbooks and a calculator, if necessary, are allowed when taking proctored exams. The Final Exam is composed of written response questions.
11. **Ask the Professor:** This communication forum provides you with an opportunity to ask your professor general or course content related questions.
12. **Student Break Room:** This communication forum allows for casual conversation with your classmates.

Unit II Blog

Post a one- to two-paragraph Blog springing from a peer-reviewed article that discusses variations in susceptibility of a specific toxicant based on sex, age, hormonal status, pregnancy, or nutritional status. Propose at least two science-based questions in the Blog, and include the link to the article from which you have extrapolated your discussion.

You can post your Blog in the corresponding Unit or click on "Tools" in the Course Menu, and then click on "Blog." Choose the Blog for this unit and post your Blog.

Please respond to at least 3 of your classmate's blog postings. If a number of students have already responded to a specific student's blog, please find another student's blog posting so everyone in our course receives feedback from their classmates.

For more information on peer-reviewed articles, and on locating articles in an online research database in general, please review this presentation from the [CSU Online Library](#).

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

Unit III Case Study

In 500 words, respond to the following scenario. Please be sure to utilize at least two references to support your response. All sources used, including the textbook, must be referenced; paraphrased and quoted material must have accompanying citations.

A woman delivers a healthy baby just prior to starting a new job at a small manufacturing plant. Within a few months after she starts work at her new job, her infant appears sickly and is hospitalized. The woman discusses her newborn's condition with her co-workers and finds an unsettling similarity to events that led up to the illness of another female coworker's child. First, how might you determine if there is a connection between the mother's new job and her child's illness? Speculate what factors you might have to address and how would you test to prove that there was a connection. Would the woman have a case if it were taken to court? Why, or why not?

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

Unit III Blog

In the Course Blog, post about three concepts you learned from the readings in Unit III that will directly relate to your future employment.

You can post your Blog in the corresponding Unit or click on "Tools" in the Course Menu, and then click on "Blog." Choose the Blog for this unit and post your Blog.

Please respond to at least 3 of your classmate's blog postings. If a number of students have already responded to a specific student's blog, please find another student's blog posting so everyone in our course receives feedback from their classmates.

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

Unit IV Research Paper

Choose a single toxicant, and explain how it can impact the immune system, respiratory system, and the liver. This paper should consist of a minimum of two pages and utilize at least two reliable references in addition to the textbook. One of your references must be a peer-reviewed resource. All sources used, including the textbook, must be referenced; paraphrased and quoted material must have accompanying citations.

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

Unit IV Blog

Post a one- to two-paragraph Blog discussing your thoughts on animal testing for immunocompetence tests. Things that you may include in your Blog include whether there are other viable options (other than animal testing) for testing immunocompetence, what the best options are, and what information we have gained/can we gain as a result of these tests.

You can post your Blog in the corresponding Unit or click on "Tools" in the Course Menu, and then click on "Blog." Choose the Blog for this unit and post your Blog.

Please respond to at least 3 of your classmate's blog postings. If a number of students have already responded to a specific student's blog, please find another student's blog posting so everyone in our course receives feedback from their classmates.

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

Unit V Article Review

Locate an article that discusses a toxicant that affects a target organ or organ system that we have discussed thus far in this course. Write an Article Review, and relate the content of what you have learned in this course to the article and to your real life experiences. This paper should include a minimum of 500 words and must include at least two references outside of the textbook. All sources used, including the textbook, must be referenced; paraphrased and quoted material must have accompanying citations.

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

Unit V Blog

Discuss three concepts you learned from this unit's reading and how they directly relate to your future employment. Post your response on the Course Blog.

You can post your Blog in the corresponding Unit or click on "Tools" in the Course Menu, and then click on "Blog." Choose the Blog for this unit and post your Blog.

Please respond to at least 3 of your classmate's blog postings. If a number of students have already responded to a specific student's blog, please find another student's blog posting so everyone in our course receives feedback from their classmates.

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

Unit VI Research Paper

Compare and contrast a toxin that affects the nervous system, one that affects the endocrine system, and another that affects the cardiovascular system. What characteristics are shared by these toxins, and what characteristics of these toxins make these toxins vulnerable to toxicity of these specific systems? This paper should be a minimum of two pages and utilize at least two reliable references in addition to the textbook. One of your references must be a peer-reviewed resource. All sources used, including the textbook, must be referenced; paraphrased and quoted material must have accompanying citations.

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

Unit VI Blog

Post a one- to two-paragraph Blog discussing your thoughts on biological warfare. Things that you may include in your Blog include immediate effects, long-term effects of these toxins on multiple generations, as well as the effects on the environment.

You can post your Blog in the corresponding Unit or click on "Tools" in the Course Menu, and then click on "Blog." Choose the Blog for this unit and post your Blog.

Please respond to at least 3 of your classmate's blog postings. If a number of students have already responded to a specific student's blog, please find another student's blog posting so everyone in our course receives feedback from their classmates.

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

Unit VII PowerPoint Presentation

Pretend that you are participating in a public safety awareness forum and that you have been selected to deliver a presentation on the health risks of one of the toxic substance categories that we have covered in this unit. Create an

The Assessment (Written Response) rubric can be found embedded in a link within the directions for each Unit Assessment. However, these rubrics will only be used when written-response questions appear within the Assessment.

The Discussion Board rubric can be found within Unit I's Discussion Board submission instructions.

Assessments).

Rubric categories include: (1) Discussion Board, (2) Assessment (Written Response), and (3) Assignment. However, it is possible that not all of the listed rubric types will be used in a single course (e.g., some courses may not have

because these are the primary tools your professor uses for assessing learning activities. This course utilizes analytic grading rubrics as tools for your professor in assigning grades for all learning activities. Each rubric serves as a guide that communicates the expectations of the learning activity and describes the criteria for each level of achievement. In addition, a rubric is a reference tool that lists evaluation criteria and can help you organize your efforts to meet the requirements of that learning activity. It is imperative for you to familiarize yourself with these rubrics because these are the primary tools your professor uses for assessing learning activities.

Grading Rubrics

The application of the APA writing style shall be practical, functional, and appropriate to each academic level, with the primary purpose being the documentation (citation) of sources. CSU requires that students use APA style for certain papers and projects. Students should always carefully read and follow assignment directions and review the associated grading rubric when available. Students can find CSU's Citation Guide in the myCSU Student Portal by clicking on the "Citation Resources" link in the "Learning Resources" area. This document includes examples and sample papers and provides information on how to contact the CSU Success Center.

APA Guidelines

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

Your report (paper) should be at least two pages in length. The title page and reference page are not included in the required paper length. Your paper must contain at least three references and may include Internet sources, books, and professional journals or resources related to the profession. All sources used, including the textbook, must be referenced; paraphrased and quoted material must have accompanying citations.

Select a toxicant that can be classified as an air, water or soil pollutant, or an organic solvent. Discuss the exposure limits of this toxicant, how an individual may be exposed, and the toxic effects. Also, discuss the possibility of the toxicant being a carcinogen and what risk assessments would be involved in the carcinogen or noncarcinogen.

Unit VIII Final Project

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

classmates.

Please respond to at least 3 of your classmate's blog postings. If a number of students have already responded to a specific student's blog, please find another student's blog posting so everyone in our course receives feedback from their

the Blog for this unit and post your Blog.

You can post your Blog in the corresponding Unit or click on "Tools" in the Course Menu, and then click on "Blog." Choose

Post a one- to two-paragraph Blog tracing the hypothetical events of a worker transferring the ill effects of exposure to an occupational toxicant to individuals outside of the workplace.

Unit VIII Blog

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

eight- to ten-slide PowerPoint Presentation discussing the major toxicological concerns, including possible sources of exposure, symptoms of toxicity, and health risks to humans. Be sure to cite references on your last slide in proper APA format. You may either utilize the speakers' notes feature to type the script of what you would say if you were to present the PowerPoint or record your voice speaking within the PowerPoint Presentation.