**Lincoln University**

**Department of Chemistry and Physics**

**Toxicology Course Syllabus**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Title:** | Toxicology | **Course number:** | CHE 305 |
| **Credit Hours**  | 3 | **Prerequisite (s):** | CHE 303  |
| **Term:** | Spring  | **Co-Requisite (s)** |  |
| **Course Method** | Lecture 3 | **Meeting day and Time:** |  |
| **Instructor:** |  | **Classroom/lab/Studio Location:** |  |
| **Office location:** |  | **e-mail:** |  |
| **Office Hours:** |  | **Phone Extension:** |  |

**COURSE DESCRIPTION:** Toxicology covers the study of poisonous chemicals, drugs, carcinogens, and other exogenous compounds. The adverse effects of these chemicals in the body will be studied, as well as their metabolism and detoxification from the body. Dose/effect relationships and route of exposure (chronic or acute) will be examined in addition to public health implications (including age, sex, environment, clinical, industrial, and legal issues of exposure).

**REQUIRED TEXT:**

Casarett and Doull’s Essentials of Toxicology, Third Edition.

ISBN-13: 978-0071847087; ISBN-10: 0071847081

**REQUIRED MATERIALS:**

 Calculator

**Assessment Criteria & Alignment**

|  |  |  |  |
| --- | --- | --- | --- |
| Course SLO | PSLOs(indicate #only) | ILOs(indicate #only) | Direct and Indirect Assessment Methods |
| CSLO 1 | 1 | 5,7 | 1,2,3,4 |
| CSLO 2 | 1,2 | 5,7 | 1,2,3,4 |
| CSLO 3 | 1,2,5 | 5,7 | 1,2,3,4 |
| CSLO 4 | 1,2,5 | 5,7 | 1,2,3,4 |
| CSLO 5 | 1,2,5 | 5,7 | 1,2,3,4 |
| CSLO 6 | 1,2,5 | 5,7 | 1,2,3,4 |
| CSLO 7 | 1,2 | 5,7 | 1,2,3,4 |
| CSLO 8 | 1,2 | 5,7 | 1,2,3,4 |
| CSLO 9  | 1,2,5 | 1 | 1 |

**Course Student Learning Outcomes (CSLO):**

Upon successful completion of this course the student will:

1. Understand the basics of toxic chemicals (including drugs, carcinogens, pesticides, metals, radioactive materials, and other) and principals of toxicology.
2. Describe the foundations of Phase I and Phase II metabolism and detoxification of toxic chemicals.
3. Explain chronic and acute exposures and dose response relationships.
4. Explain the basics of toxicokinetics.
5. Describe the mechanisms of carcinogenesis.
6. Understand how genetics may modify the body’s response to a chemical (genetic toxicology).
7. Understand developmental toxicology.
8. Explain specific target organ toxicity (blood, immune system, liver, kidney, and other).
9. Expand comprehension and ability to discuss scientific manuscripts.

**Program Student Learning Outcomes (PSLO):**

1. The student will be able to interpret and explain concepts of chemistry covered in class.
2. The student will be able to solve complex problems using critical thinking skills.
3. The student will be able to design and formulate experiments to test or challenge hypotheses presented in the laboratory.

**Institutional Learning Outcomes (ILO):**

1. Effective communication

5. Critical Thinking

7. Quantitative Literacy

**DIRECT AND INDIRECT ASSESSMENT MEASURES FOR EACH SLO:**

1. Quizzes/Assignments

• Select quiz questions or assignments that measure a specific SLO.

• Standard: 75% of the students should reach the minimally acceptable score of 75%.

2. Multiple choice (MC) questions on hour and final exams

• Select MC questions designed to measure a specific SLO on exams.

• Standard: 75% of the students should reach the minimally acceptable score of 75%.

3. Short answer questions on hour and final exams

• Select short answer and problem solving questions designed to measure a specific SLO on exams.

• Standard: 75% of the students should reach the minimally acceptable score of 75%.

4. Essay questions on hour and final exams

• Select essay questions designed to measure a specific SLO on exams.

• Standard: 50% of the students should reach the minimally acceptable score of 75%.

**Calculation of Final Grades**: The final grade will be the average of grades earned on quizzes, assignments, class participation, in-class exams, and final exam.

**Course Evaluation:**

In-class examinations 40%

Quizzes/assignments 30%

Class Participation 10%

Final Exam 20%

**Total 100%**

**GRADING SCALE:** (Should follow Department and/or College Template)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Grade | A | A- | B+ | B | B- | C+ | C | C- | D+ | D | F |
| GPA Points | 4.0 | 3.7 | 3.3 | 3.0 | 2.7 | 2.3 | 2.0 | 1.7 | 1.3 | 1.0 | 0.0 |
| % | 100-93 | 92.9-90 | 89.9-88 | 87.9-82 | 81.9-80 | 79.9-78 | 77.9-72 | 71.9-70 | 69.9-67 | 66.9-60.1 | 60 and under |

**SCHEDULE OF LEARNING topics covered**

|  |  |  |
| --- | --- | --- |
| Week | Topic | Chapter |
| 1 | Principals of toxicology | 1,2 |
| 2 | Mechanisms of toxicology | 3 |
| 3 | Absorption, distribution, and detoxification of toxicants | 5 |
| 4 | Biotransformation of xenobiotics (Phase I & 2 metabolism) | 6 |
| 5 | Toxicokinetics | 7 |
| 6 | Carcinogens and their mechanisms of action & detoxification | 8 |
| 7 | Genetic Toxicology | 9 |
| 8 | Developmental toxicology | 10 |
| 9 | Target organ toxicity | 11 |
| 10 | Toxic responses of the blood & immune system | 11, 12 |
| 11 | Toxic responses of the liver, kidney, and other organs | 13,14, 20 |
| 12 | Toxic effects of pesticides, metals, and radioactive materials | 22-23, 25 |
| 13 | Public health implications of toxic chemicals & Legal / Policy issues | 30, 34 |
| 14 | Environmental toxicology & Industrial / Occupational exposures | 30, 34 |
| 15 | Clinical implications of toxic chemicals | 33 |
| \* | Final Exam as scheduled by the registrar |  |

#### **University ATTENDANCE POLICY:**

Lincoln University uses the class method of teaching, which assumes that each student has something to contribute and something to gain by attending class. It further assumes that there is much more instruction absorbed in the classroom than can be tested on examinations. Therefore, students are expected to attend all regularly scheduled class meetings and should exhibit good faith in this regard.

<http://www.lincoln.edu/registrar/2014Catalog.pdf>

**STUDENTS WITH DISABILITIES STATEMENT:**

Lincoln University is committed to non-discrimination of students with disabilities and therefore ensures that they have equal access to higher education, programs, activities, and services in order to achieve full participation and integration into the University.  In keeping with the philosophies of the mission and vision of the University, the Office of Student Support Services, through the Services for Students with Disabilities (SSD) Program, provides an array of support services and reasonable accommodations for students with special needs and/or disabilities as defined by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990.  The Services for Students with Disabilities Program seeks to promote awareness and a campus environment in which accommodating students with special needs and/or disabilities is natural extension of the University’s goal.

Any student with a documented disability should contact the Office of Student Support Services.

<http://www.lincoln.edu/studentservices/index.html>

**UNIVERSITY ACADEMIC INTEGRITY STATEMENT:**

Students are responsible for proper conduct and integrity in all of their scholastic work. They must follow a professor's instructions when completing tests, homework, and laboratory reports, and must ask for clarification if the instructions are not clear. In general, students should not give or receive aid when taking exams, or exceed the time limitations specified by the professor. In seeking the truth, in learning to think critically, and in preparing for a life of constructive service, honesty is imperative. Honesty in the classroom and in the preparation of papers is therefore expected of all students. Each student has the responsibility to submit work that is uniquely his or her own. All of this work must be done in accordance with established principles of academic integrity.

<http://www.lincoln.edu/registrar/2014Catalog.pdf>

**POLICY ON ELECTRONIC DEVICES IN CLASSROOM:**

No electronic devices will be allowed in the classroom, unless previously approved by the instructor.