



Mel and Enid Zuckerman College of Public Health
University of Arizona

SYLLABUS
Toxicology and Chemical Exposure CPH 553
Spring 2016

Time: 1:00 – 2:15 p.m., Monday and Wednesday
Location: Drachman Hall A-112
Course Instructors: Jefferey L. Burgess, MD, MS, MPH (jburgess@u.arizona.edu)
Mark D. Van Ert, Ph.D., CIH (vanert@dakotacom.net)
Office/Office Hours: Drachman Hall Room A235/Visits by appointment
Teaching Assistant/T.A. Office Hours N/A

Catalog Description: Principles of toxicology related to industry and the environment; dose response; mechanisms of toxicity; hazard evaluation principles; toxicology of major classes of industrial and environmental compounds.

Course Description: This course will cover the recognition and toxicology of specific chemical agents and chemical groups including hazard identification, hazard evaluation, mechanisms of toxicity, dose-response, use in industry and exposures from the environment.

Course Prerequisites: None, although previous courses in chemistry and biology are strongly recommended.

Course Learning Objectives:

- Utilize various information sources to identify chemicals commonly employed in industry
- Appreciate the potential toxic effects of various families of chemical agents
- Understand the basic mechanisms of toxicity of selected chemical agents relative to exposure level
- Appreciate the significance of exposure levels relative to currently acceptable exposure limits
- Describe common chemical exposures by specific industry and environment

MPH/Section/ABET Competencies Covered:

A. 1. Define a problem
A. 2. Determine appropriate uses and limitations of data
A. 4. Evaluate the integrity and comparability of data and identify gaps in data sources
A. 5. Understand how data illuminate ethical, political, scientific, economic, and overall public health issues
A. 7. Make relevant inferences from data
B. 1. Communicate professionally both verbally and in writing
C. 6. Identify public health laws, regulations, and policies related to specific programs
D. 2. Interact competently, respectfully, and professionally with persons from diverse backgrounds

E. 1. Define, assess, and understand the health status of population, determinants of health and illness, and factors contributing to health promotion and disease prevention
E. 3. Apply basic public health sciences including environmental health to the prevention of chronic diseases and injuries
Anticipate and recognize stressors, know toxic effects, correctly apply legal standards to the workplace, and recognize the need for life-long learning

Course Notes: Lecture notes will be made available on a course website or handed out.

Required Text/Readings: None

The course will generally use on-line materials for reading assignments.

Recommended but not required texts include:

Sullivan and Krieger’s Clinical Environmental Health and Toxic Exposures, 2nd edition.

Casarett and Doull’s Toxicology: The Basic Science of Poisons, 8th edition

Hawley’s The Condensed Chemical Dictionary, 9th edition

Luttrell et al., Toxicology Principles for the Industrial Hygienist

Meyer’s Chemistry of Hazardous Materials, 2nd edition

Patty’s Industrial Hygiene and Toxicology, Vols I – IV

Course Requirements: Students will be required to complete quizzes, homework, article reviews, work-site visits, two midterm exams, and a final exam. In addition, development of a final project addressing an environmental or occupational health exposure and related health effects will be required with an associated presentation to the class. The topic must be pre-approved by the course instructor.

Grading/Student Evaluation: The following scale will be a general guideline for the determination of course grades. If necessary, a revised copy may be passed out at a later date.

2 Midterm Exams	25% each	Final Exam	25%
Final project	15%	Assignments/Quizzes/Participation	10%

Assignments submitted late will receive zero points unless a prior extension has been requested and approved by the instructor. Final grades will be based on the following relative point system: A = 90-100%; B = 75-89%; C = 65-74%; D = 50-64%; E = < 50%.

Class Attendance/Participation: Students are expected to attend classroom sessions and participate in class discussions. All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion, and absences pre-approved by the UA Dean of Students (or Dean's designee) will be honored. Class make-ups can be arranged with instructor permission.

Course Schedule:

Month	Date	Topic
January	13	Introduction/ Hazardous Materials Incidents
	18	MARTIN LUTHER KING JR. DAY – NO CLASS
	20	Hazardous Materials Incidents (continued)

	25	Principles of Toxicology
	27	Hazard Evaluation Principles (MVE)
February	1	PBPK Modeling (Beamer)
	3	Asphyxiants / Acids / Bases
	8	Metals I – Arsenic / Arsine / Stibine / Lead / Mercury / Manganese
	10	Metals II – Beryllium / Zinc / Cadmium / Chromium
	15	Presentations of TLV documentation
	17	Respirator fit-testing
	22	MIDTERM 1/ TLV documentation and Final project outlines due
	24	TBD
	26	Friday Field Trip I - Time and location TBD (MVE)
	29	Respiratory Toxicology
March	2	Dermal, Cardiovascular, Renal and Sensory Toxicology
	7	Neurotoxicology/Hepatic Toxicology
	9	Immunotoxicology/Reproductive and Genetic Toxicology
	14	NO CLASS- UA SPRING BREAK
	16	NO CLASS- UA SPRING BREAK
	21	Carcinogenesis / Teratogenesis
	23	Aliphatic Hydrocarbons (MVE)
	28	Aromatic and Chlorinated Hydrocarbons (MVE)
	30	Ketones and Aldehydes (MVE)
April	4	MIDTERM EXAM 2
	6	Mining/smelting hazards
	8	Friday field trip II 6:20 AM - 5:30 PM - Smelter tour

	11	Methamphetamine laboratories and Final Project Draft Due
	13	Alcohols
	18	Pesticides I
	20	Pesticides II
	25	Class Presentations
	27	Class Presentations and Final Project Due
May	2	Class Presentations
	4	Class Presentations
	9	FINAL EXAM 1:00 – 3:00 p.m.

Communications: You are responsible for reading emails sent to your UA account from your professor and the announcements that are placed on the course web site. Information about readings, news events, your grades, assignments and other course related topics will be communicated to you with these electronic methods. The official policy can be found at:

<http://www.registrar.arizona.edu/emailpolicy.htm>

Disability Accommodation: If you anticipate issues related to the format or requirements of this course, please meet with me. I would like us to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with Disability Resources (621-3268; drc.arizona.edu) and notify me of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations. The official policy can be found at:

<http://catalog.arizona.edu/2015%2D16/policies/disability.htm>

Academic Integrity: All UA students are responsible for upholding the University of Arizona Code of Academic Integrity, available through the office of the Dean of Students and online: The official policy found at: <http://deanofstudents.arizona.edu/codeofacademicintegrity>

Classroom Behavior: (Statement of expected behavior and respectful exchange of ideas)
The Dean of Students has set up expected standards for student behaviors and has defined and identified what is disruptive and threatening behavior. This information is available at:

<http://deanofstudents.arizona.edu/disruptiveandthreateningstudentguidelines>

Students are expected to be familiar with the UA Policy on Disruptive and Threatening Student Behavior in an Instructional Setting found at:

<http://policy.arizona.edu/education-and-student-affairs/disruptive-behavior-instructional-setting>

and the Policy on Threatening Behavior by Students found at:

<http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>

Grievance Policy: Should a student feel he or she has been treated unfairly, there are a number of resources available. With few exceptions, students should first attempt to resolve difficulties informally by bringing those concerns directly to the person responsible for the action, or with the student's graduate advisor, Assistant Dean for Student and Alumni Affairs, department head, or the immediate supervisor of the person responsible for the action. If the problem cannot be resolved informally, the student may file a formal grievance using the Graduate College Grievance Policy found at: <http://grad.arizona.edu/academics/policies/academic-policies/grievance-policy>

Grade Appeal Policy: <http://catalog.arizona.edu/2015-16/policies/gradappeal.htm>

UA Smoking and Tobacco Policy:

The purpose of this Policy is to establish the University of Arizona's (University) commitment to protect the health of University faculty, staff, students, and visitors on its campuses and in its vehicles. The latest version of the policy is available at:

<http://policy.arizona.edu/ethics-and-conduct/smoking-and-tobacco-policy>

Syllabus Changes: Information contained in the course syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate.

Telephone and Computer Use: You are not allowed to have your computer on during class unless approved by the instructor. Turn your cell phones to silent or vibrate in order to not disrupt the class and disturb your fellow students.