Mel and Enid Zuckerman College of Public Health
University of Arizona

SYLLABUS
Toxicology and Chemical Exposure CPH 553
Fall 2011

Time: 1:00 – 2:15 p.m., Monday and Wednesday
Location: Drachman Hall A-116
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 TBD

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.

Note: Students are encouraged to attend PCOL 602a – General and Systems Toxicology (Cherrington)

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 Competencies:

MPH
• Understands how the data illuminates ethical, political, scientific, economic, and overall public health issues
• Communicates effectively both in writing and orally (unless a handicap precludes one of those forms of communication)
• Identifying public health laws, regulations, and policies related to specific programs
• Defining, assessing, and understanding the health status of population, determinants of health and illness, factors contributing to health promotion and disease prevention, and factors influencing the use of health services
EOH

• Recognize and classify the major types of chemical, physical and biological exposure agents capable of inducing disease in the public.
• Utilize basic strategies for evaluating or measuring exposure to chemical, physical and biological agents.
• Identify control methods for reducing worker or public exposures to acceptable levels.
• Describe factors which influence the behavior of aerosols and their ultimate fate including deposition in the respiratory system.
• Utilize appropriate technical approaches for conducting environmental and industrial assessments.
• Utilize various sources of information to identify chemicals commonly employed in industry and their toxicity.
• Describe the base mechanism of toxicity and potential health effects and diseases caused by various chemical agents.

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

Required Text/Readings: None
The course will generally use on-line materials for reading assignments.
Recommended but not required texts include:
Casarett and Doull’s Toxicology: The Basic Science of Poisons, 6th 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 short quizzes, homework, article reviews, work-site visits, two midterm exams, and a final exam. In addition, development of an on-line module 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.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>2 Midterm Exams</td>
<td>25%</td>
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<tr>
<td>Final Exam</td>
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<td>Technical Paper</td>
<td>15%</td>
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<td>Assignments/Quizzes</td>
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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:** 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 by the instructor.

<table>
<thead>
<tr>
<th>Month</th>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>August</td>
<td>22</td>
<td>Introduction/ Hazardous Materials Incidents</td>
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<td></td>
<td>24</td>
<td>Hazardous Materials Incidents</td>
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<td></td>
<td>29</td>
<td>Hazard Evaluation Principles (MVE)</td>
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<td></td>
<td>31</td>
<td>Principles of Toxicology</td>
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<td>September</td>
<td>5</td>
<td><strong>LABOR DAY – NO CLASS</strong></td>
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<td></td>
<td>7</td>
<td>Respiratory Toxicology</td>
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<td></td>
<td>12</td>
<td>Dermal, Cardiovascular, Renal and Sensory Toxicology</td>
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<td></td>
<td>14</td>
<td>Metals – Beryllium / Zinc / Cadmium / Chromium</td>
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<td></td>
<td>19</td>
<td>Metals – Arsenic / Arsine / Stibine / Lead / Mercury / Manganese</td>
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<td></td>
<td>21</td>
<td>Carcinogenesis/Teratogenesis</td>
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<td>26</td>
<td><strong>MIDTERM 1/ TLV documentation and training module topics due</strong></td>
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<td></td>
<td>28</td>
<td>Aliphatic Hydrocarbons (MVE)</td>
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<td>October</td>
<td>3</td>
<td>Aromatic and Chlorinated Hydrocarbons/ (MVE)</td>
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<td></td>
<td>5</td>
<td>Mining/smelting hazards</td>
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<td>7 (Friday)</td>
<td>Mine/smelter visit (Leave classroom 7:00 AM, return 5:30 PM)</td>
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<td>10</td>
<td><strong>Presentations of TLV documentation</strong></td>
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<td>12</td>
<td><strong>NO CLASS</strong> (Replaced by site visit)</td>
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<td>17</td>
<td>Ketones and Aldehydes (MVE)</td>
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<td></td>
<td>19</td>
<td>Ketones and Aldehydes (MVE)</td>
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<td>24</td>
<td>Neurotoxicology/Hepatic Toxicology</td>
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<td>26</td>
<td>Immunotoxicology/Reproductive and Genetic Toxicology</td>
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<td>31</td>
<td>Asphyxiants / Acids/Base</td>
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November

2 Alcohols

7 MIDTERM EXAM 2

9 Pesticides I

14 Pesticides II

16 Site visit / lecture to be determined Training module due

21 Methamphetamine laboratories

25 NO CLASS (pre-Thanksgiving)

28 Class Presentations

30 Class Presentations

December

5 Class Presentations

7 Class Presentations

12 FINAL EXAM 10:30 – 12:30 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, grades, assignments and other course related topics will be communicated to you electronically. 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/2011%2D12/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: 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 Behavior in an Instructional Setting found at http://web.arizona.edu/~policy/disruptive.pdf and the Policy on Threatening Behavior by Students found at http://web.arizona.edu/~policy/threatening.pdf.
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/2008%2D09/policies/gradappeal.htm

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. Turn your cell phones to silent or vibrate in order to not disrupt the class and disturb your fellow students.

Plagiarism: What counts as plagiarism?
• Copying and pasting information from a web site or another source, and then revising it so that it sounds like your original idea.
• Doing an assignment/essay/take home test with a friend and then handing in separate assignments that contain the same ideas, language, phrases, etc.
• Quoting a passage without quotation marks or citations, so that it looks like your own.
• Paraphrasing a passage without citing it, so that it looks like your own.
• Hiring another person to do your work for you, or purchasing a paper through any of the on- or off-line sources.