C. Eckhert

Syllabus: Introduction to Environmental Health (EHS 100) UCLA Spring 2015

Room and Time: CHS 43-105 T & Th 1:00-3:00 pm

Instructor: Dr. Curt Eckhert (CHS 76-080) **Office hours:** After every class or by appointment.

Course Readers: Tamanna Rahman [shama15@ucla.edu]; Olivia Ellis [microlabrat@aol.com]

Website: http://www.ph.ucla.edu/ehs/ehs100/

Prerequisites: Preparation in biological and chemistry necessary to understand basic concepts underlying health and disease and modern concepts of public health surveillance. The biology and chemistry prerequisites for undergraduate admission to the UC System are adequate for most students to understand the concepts.

Overview: This course has been taken by thousands of UCLA students majoring in over 35 different disciplines. One of the themes is that humans have a long history of finding solutions to environmental problems and these problems have become more complex and difficult to solve as populations have grown in size and density. The goal of the course is to provide students with sufficient knowledge so they can read, with understanding, articles related to environmental exposure and health in journals written for broadly educated health professionals such as *Environmental Health Perspectives, Science, Nature* and *The New England Journal of Medicine*. This is achieved by providing a foundation for understanding why the risk of disease is affected by the environment. Understanding "why" requires understanding "how" and there are several: how populations are exposed to environmental hazards; how cells alter chemicals and chemicals alter cells; how environmental agents alter genes, cells and organ systems; how genetic susceptibility and health status affect the risk of environmental disease; and how environmental risks and benefits are assessed and managed.

Design of Course: This ten week course is designed to provide a foundation for understanding how the environment influences human health. Lectures and book chapters are coordinated and provide sufficient background so the topic is accessible to all student majors. Lectures are given from 1:00 to 3:00 pm each Tuesday and Thursday. Each lecture covers a different topic and begins with a presentation of the scientific background required for understanding the health problems associated with the topic and the strategies used to prevent those problems. Lectures provide an opportunity for students to ask questions, class discussions and present material not in the book.

Learning Objectives: The following learning objectives will be achieved in the context of lectures, text and homework assignments. By the end of the course students will be able to:

1. Understand the co-evolution of civilization and barriers to infectious and environmental disease
2. Be conversant about the U.S system of environmental laws
3. Describe environmental justice and exposure to environmental stressors in communities and the workplace
4. Describe surveillance procedures for hazards in communities and the workplace
5. Understand the basis of genetic and non-genetic susceptibility to environmental disease
6. Describe the major mechanisms of toxicity
7. Understand basic principles of toxicokinetic and toxicodynamics
8. Understand how a risk assessment document is prepared, the information it contains, and how it is used to manage risk to environmental hazards
9. Describe the major environmental problems caused by solid and hazardous waste, water pollution, air pollution and agriculture
10. Understand the challenges of producing sufficient food for an expanding population under changing climate conditions while maintaining the quality of the environment
11. Understand the relationship between population size, its control and environmental sustainability
12. Understand the ideas underpinning environmental policy
13. Understand basic principles that underlie climate change and its impact on human and ecological health

Examinations: Two 1 hour exams each worth 20%; homework assignments 10% and final is 50% of final grade.

Assignments: Four items worth 10% of final grade. Guidelines for completing assignments are on the class website. See bottom outline for due dates using *Turnitin* on the *My UCLA* website.

1) Review of a research journal article (2%)
2) Review research seminar or a second journal article (2%)

3) Write a summary of a risk assessment on chemical of choice (3%) see EPA Iris Assessments at http://www.epa.gov/iris/

4) Prepare a proposal outlining a testable model of environmental injury (3%). The proposal should include (a) description of a health problem; (b) a falsifiable hypothesis formulated to learn more about the fundamental nature of the problem; (c) methods – describing quantitative measurements that have the potential to falsify the hypothesis; (d) results - how data collected using the methods will be analyzed; (e) conclusion - what results will look like if the hypothesis is falsified and again if it is supported.

Required Text: "Environmental Determinants of Health" by C. Eckhert is available at Course Reader Material, 1080 Broxton Ave, Westwood, CA.

Other Material: Prior to each lecture a draft of the topic PowerPoint will be available to download in handout form the course website. A final PowerPoint will be posted after the lecture. **URLs:** The course website has links to websites on specific topics, government agencies and programs to supplement the course material.

If you wish to request an accommodation due to a disability, please contact the Office for Students with Disabilities as soon as possible at A255 Murphy Hall, (310) 825-1501, (310) 206-6083 (telephone device for the deaf). Website: *www.osd.ucla.edu*.

Course Outline		
Date	**Topic**	**Chapter**
Mar 30 (T)	Introduction; Evolving Civilization and Environmental Challenge	1,2
Apr 2 (Th)	Cleanliness, Conservation the Environment and Law	3
Apr 7 (T)	Exposure to Environmental Stressors: Biological, Physical and Ergonomic	4
Apr 9 (Th)	Surveillance and Susceptibility; begin Toxicokinetics	5
Apr 14 (T)	How Chemicals Cause Harm: Toxicokinetics and Toxicodynamics	6
Apr 16 (Th)	Reproductive and Developmental Disruption by Environmental Chemicals & Other Stressors	7
Apr 21 (T)	**Exam** Neurotoxicity of metals & Neurobehavioral effects of Addiction to Tobacco (nicotine) and Drugs	8
Apr 23 (Th)	Radiation: Ionizing and Non-Ionizing	9
Apr 28 (T)	Genotoxins: Genetic Instability and Epigenetic Changes	10
Apr 30 (Th)	Cancer: Role of the Environment in the Carcinogenic Process	11
May 5 (T)	Risk Assessment Methods, Risk Management and Communication	12
May 7 (Th)	Community Solid Wastes and Hazardous Wastes and their Management	13
May 12 (T)	**Exam**	
May 14 (Th)	Drinking Water - Procurement and Treatment of Wastewater	14,15
May 19 (T)	Air Pollution: Urban Smog, Air Particulates,	16
May 21 (Th)	Health Effects of Air Pollution	16
May 26 (T)	Agriculture's Challenge: Food Security and Environmental Sustainability	17
May 28 (Th)	Environmental Policy	18
Jun 2 (T)	Population and Environmental Resources	19
Jun 4 (Th)	Climate Change	20
June 11(Th)	**Final Exam** Thursday June 1, 2015, 8:00am-11:00am **(NO MAKE UP EXAM)**	
Required: Text "Environmental Determinants of Health" Available at Course Reader Material, 1080 Broxton Ave., Westwood. Grading: 20% each midterm exam; 50% final, 10%. Assignments 1, 2, 3 & 4 are due respectively on **Apr 17, 24, May 8, May 20 at 11:59 pm** by uploading using Turnitin on *My UCLA*.		