

BIOLOGICAL AND HEALTH SURVEILLANCE MONITORING IN OCCUPATIONAL/ ENVIRONMENTAL HEALTH 2017

EHS 256 842-338-200 4 units CHS 51-279 Thurs 3-6 pm

Instructor: Shane Que Hee, CHS 56-071A, 67388(voice mail), squehee@ucla.edu

AIMS. The course explores the theoretical and practical basis of human biological monitoring, health surveillance, and medical monitoring through lectures, literature assignments, and problems. While mostly focused on occupational exposures, exposures to hazardous substances in the ambient environment (particularly at hazardous waste sites) are also covered through specific and nonspecific biomarkers of exposure, effect, and susceptibility.

LEARNING OBJECTIVES. The student will be able to interpret biological monitoring data for markers in human biological fluids. Markers of dose, effect, and susceptibility will be understood and the differences articulated. Non-invasive and invasive markers will be understood. When markers are necessary to complement air sampling or to replace the latter will be understood for worker monitoring, and articulated. The literature of biological monitoring will be located and utilized, and papers in the peer-reviewed literature critically evaluated.

The Environmental Health competencies for EHS Master of Science students are: A1 Retrieve and organize literature; synthesize and critically evaluate scientific literature in environmental health, public health and other relevant fields; A2 Use existing databases to provide background information or data to address research questions and draw appropriate inferences/estimates from environmental health data; A3 Evaluate seminars and presentations in environmental health and distill the critical and salient issues from them; B5 Be able to articulate interdisciplinary approaches to solving public health problems; C1 Use computer systems and analytic software packages; D1 Make reasonable inferences from results of analysis of observational and analytic studies; E1 Prepare presentation materials including outlines, posters, and Powerpoint presentations; E2 Deliver effective oral presentations individually and as part of a team; F4 Identify and implement appropriate safety controls and practices.

The EHS MPH competencies are: C1 Describe major direct and indirect human health and safety effects of major environmental or occupational agents; C2 Describe physiologic and psychosocial factors that affect susceptibility to adverse health outcomes following exposure to environmental hazards; C3 Describe federal and state regulatory programs, guidelines, and authorities that control environmental health issues; C5 Specify approaches for assessing, preventing and controlling environmental hazards that pose risks to human health and safety; C6 Identify key sources of data and use existing databases to provide background or supportive data to address environmental health questions; C8 Develop a testable model of environmental insult.

The crosscutting competencies involved are: communication & informatics; diversity & culture; public health biology; professionalism; program planning; systems thinking

FORMAT: Examination will be by progressive assessment with a final oral seminar. There is no laboratory and no closed book Final Written Examination or Midterm Examination. Assignments will be issued starting Week 2, each being due in two weeks. Lateness will incur a penalty of 10% per day. The last assignment includes the final oral seminar and written assignment: it accounts for 50% of the marks. The oral examination is 12.5% of the marks.

LECTURES (pages refer to TEXT)

1. Definitions (chemistry, biochemistry and physiology background; blood, breath, and urine as media for human biological monitoring; absorption, distribution, pharmacokinetics, excretion); text pp 3-186.
2. Continued
3. BEIs; pp 436-481. Documentation of the BEIs. TLVS/BEIs
4. Medical Monitoring; pp 187-299; pp 421-435
5. Adducts; pp 303-338
6. Immunoassays; pp 339-357
7. AIDS and HIV; pp 358-418
8. Pesticides; pp 482-510
9. Hazardous Waste Sites; non-workplace exposures; pp 511-534
10. Continued

Note: Thurs Nov 23 is a holiday because of Thanksgiving

FINAL EXAMINATION FOR ORAL SEMINARS: TBA

NOTE:

Students needing academic accommodations based on a disability should contact the Center for Accessible Education (CAE) at [\(310\)825-1501](tel:3108251501) or in person at Murphy Hall A255. When possible, students should contact the CAE within the first two weeks of the term as reasonable notice is needed to coordinate accommodations. For more information: www.cae.ucla.edu

TEXTS:

SS Que Hee, Biological Monitoring: An Introduction, Van Nostrand Reinhold/Wiley, New York, ISBN 0-442-23677-8, 1993. On Reserve in Biomedical Library. Also in COEH Library CHS 46-060 (get key from CHS 56-070).

ACGIH, 2017 TLVs and BEIs. ACGIH, Cincinnati, OH, 2017. On Biomedical Library Reserve.

RECOMMENDED TEXT: Documentation of the Biological Exposure Indices, ACGIH, 7th edition, 2001.

X-DBE. In COEH Library. Reference Section of Library; up to date version on Biomedical Library Reserve.

OTHER READING: 1st text Appendix C references (Biomed. Libr.)

SS Que Hee, Biological Monitoring, Chapter 19, *The Occupational Environment: Its Evaluation*,

Control, and Management, 3rd Ed., Ed. DH Anna, American Industrial Hygiene Association, Fairfax, Virginia, 2011, pp 502-535.

GA Day, AB Stefaniak. The Skin and the Work Environment, Chapter 20, *The Occupational Environment: Its Evaluation, Control, and Management*, 3rd Ed., Ed. DH Anna, American Industrial Hygiene Association, Fairfax, Virginia, 2011, pp 536-559.

SS Que Hee (Editor). *Biological Monitoring: A Practical Field Manual*, Am. Ind. Hyg. Assoc, Fairfax, VA, 2004. New edition in 2014.

SS Que Hee, Determination of Parent and Progeny Compounds in Exhaled Breath, in: *Encyclopedia of Analytical Chemistry*, John Wiley and Sons Ltd, Chichester, Sussex, England, 2000, pp. 4718-4733.

S Carter, M Morgan, S Que Hee, and TJ Buckley, Biological Monitoring, in: *Essential Resources for Industrial Hygiene*, Harris, M.K. (Ed.), Am. Ind. Hyg. Assoc., Fairfax, VA, 2000, pp.131-139.

SS Que Hee and M Boeniger, Dermal Chemical Hazards, in: *Essential Resources for Industrial Hygiene*, Harris, M.K. (Ed.), Am. Ind. Hyg. Assoc., Fairfax, VA, 2000, pp. 141-154.

VIDEOS (Biomed Lib reference desk; Please rewind videotapes beforehand before returning):

1. *The VirtualBody: Circulation, Respiration and Breathing*, Films for the Humanities & Sciences, Princeton, NJ, 2002, 20 min. X-VBC
2. *The Living Body: The Urinary Tract: Water!*, Films for the Humanities and the Sciences, Princeton NJ, 1985, 25 min. X-LVG
3. *Food and Digestion*, Films for the Humanities & Sciences, Princeton, NJ, 2006, 27 min.
4. *Skin*, Films for the Humanities & Sciences, Princeton NJ, 2010. 56 min.
5. *Your Immune System*, Cambridge Educational, 2004. 20 min. X-YIS
6. *Handling Tissue Specimens & Blood Products*, Mosby Lifeline, 2005. 10 min. X-HTS

Web Sites

www.acgih.org; www.aiha.org; www.cdc.gov/niosh; www.osha.gov; www.epa.gov;
www.cdc.gov/atsdr; www.fda.gov; www.who.org; www.ecm.org