

INDUSTRIAL AND ENVIRONMENTAL HYGIENE ASSESSMENT 2016

EHS 252G (842-313-200), 4 units

CHS 41-235 SPRING QUARTER

INSTRUCTORS: Professor Que Hee ("67388,squehee@ucla.edu)

Fridays, 8 a.m.-12 noon

Prerequisites: Those students who already have experience in field sampling do not need to register for this course, but all those who have not, or feel they need more knowledge and field experience, should register.

AIMS: This course integrates industrial and environmental hygiene principles of field sampling through lecture, walkthrough surveys, group discussion of sampling strategy, laboratory calibration of instruments, actual field measurements involving area and personal sampling for chemical and physical hazards, safety, and required chemical and data analyses.

LEARNING OBJECTIVES: The student who completes this course will be able to initiate actual field industrial and environmental hygiene assessment on a sound scientific basis, and produce succinct and lucid reports, PowerPoint presentations on the field results, and oral presentation of the results of a standard required at national conferences. This course integrates all the student's previous courses in industrial and environmental hygiene. It is a capstone course.

The EHS Master of Science competencies involved are: A2 Use existing databases to provide background information or data to address research questions and draw appropriate inferences/estimates from environmental health data; 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; E3 Explain and interpret research findings for students, professionals, the public, and media; F4 Identify and implement appropriate safety controls and practices

The EHS Master of Public Health competencies involved 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 question; C7 Discuss various risk management and risk communication approaches, including their relation to issues of environmental justice and equality

The following cross-cutting public health competencies (CC) are also reflected in the design and content of the course: communication and informatics; diversity & culture; leadership; public health biology; professionalism; program planning; systems thinking.

FORMAT: The first two weeks will summarize the theoretical basis of field sampling and sampling strategies for gases, vapors, aerosols, ventilation, ergonomics and safety before the field sampling sessions are performed.

Typically, a walkthrough survey of the specific workplace under faculty supervision, will be followed by a group discussion in the room designated above to define the hazards and instruments required for the field sampling the following week. Calibration of instruments and pumps will start on the day before and on the day of the field work before and after the sampling process.

Remember to ensure adequate charging time of pumps and instruments. Field measurements may last up to 4 hours for personal sampling. Chemical and data analyses of selected samples will occur after return from the field.

Reports are due two weeks after the field expedition, or after students receive analytical lab results, as appropriate. Each report is to include a literature survey to compare the group's results with those of the same hazards in the literature. The report format is: Title Page with subject, names of students in the designated group, workplace contact information, dates of walkthrough and sampling, and faculty involved; Abstract (1 page); Background where the literature is surveyed; Walkthrough; Sampling Day Methods; Results; Discussion; Recommendations; References; Appendices. Copies of the reports will be sent to UCLA Environment, Health, and Safety for their information.

EVALUATION: Evaluation will be through grading of the reports for each trip as well as performance during the discussions, laboratory work, and field work. The final examination will feature the presentation of group findings via PowerPoint presentation which will have the same weight as a lab

report.

OPTIONAL TEXT: BA Plog, J Niland, PJ Quinlan. *Fundamentals of Industrial Hygiene*, 4th Ed., National Safety Council, Chicago, IL, 1996. Biomed Bookstore.

Brian Kelly, *What's Happened to my Slides: Giving Presentations at Conferences*, Cultivate Interactive, 3, January, 2001. www.cultivate-int.org/issue3/presentations.

OTHER READINGS:

1. GD Clayton, FE Clayton (Eds). *Patty's Industrial Hygiene and Toxicology*, 4th Ed., Vol 1 Part B, Chapter 25 (Industrial Hygiene Records and Reports), Chapter 27 (Industrial Hygiene Sampling and Analysis), Chapter 28 (Industrial Hygiene Engineering Controls), Chapter 37 (Safety Interfaces, Profession and Practice), and Chapter 40 (Ergonomics).

READING LIST:

1. SD DiNardi, Ed. *The Occupational Environment-its Evaluation and Control*, 2nd Ed, AIHA, Fairfax, VA, 2003. A new edition is to be published in 2011.
2. BS Cohen, SV Hering (Ed). *Air Sampling Instruments*, 8th Ed. or later, American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio, 1995.
3. Committee on Industrial Ventilation. *Industrial Ventilation*, 26th Ed. or later, American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio, 1995.
4. NIOSH. *A Guide to Industrial Respiratory Protection*, DHEW (NIOSH) Public No 76-189, Washington DC, 1987.
5. NIOSH. *Occupational Exposure Sampling Strategy Manual*, DHEW (NIOSH) Public No 77-173, Washington DC, 1977.
6. ACGIH. *Documentation of the Threshold Limit Values and Biological Exposure Indices*, 6th Ed., Cincinnati, Ohio, 1991. 7th Ed, 1998+.
7. ACGIH. *2010 TLVs and BEIs: Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, ACGIH, Cincinnati, Ohio, 2010.
8. NIOSH. *NIOSH Pocket Guide to Chemical Hazards*, DHHS (NIOSH) Public No 2005-149, 2005. <http://www.cdc.gov/niosh/npg/>
9. J LaDou (Ed). *Introduction to Occupational Health and Safety*, National Safety Council, Chicago, IL, 1986.
10. WA Burgess. *Recognition of Health Hazards in Industry*, John Wiley, 2nd Ed., New York, New York, 1995.
11. NIOSH. *Occupational Disease: a Guide to their Recognition*, USDHEW (NIOSH) Public No 77-181, 1977.
12. LV Cralley, LJ Cralley. *Industrial Hygiene Aspects of Plant Operations*, Macmillan, New York, New York, 1982-4.
13. NIOSH. *NIOSH Manual of Analytical Methods*, 5th Ed., Cincinnati, Ohio, <http://www.cdc.gov/niosh/docs/2003-154/>
14. OSHA. *OSHA Analytical Methods Manual*, OSHA, Salt Lake City, UT, <http://www.osha.gov/dts/sltc/methods/toc.html>
15. M Grayson (Ed). *Kirk-Othmer Encyclopedia of Chemical Technology*, 5th Ed., John Wiley, New York, New York,

<http://mrw.interscience.wiley.com/emrw/9780471238966/home/>

16. PJ Liroy. Human exposure assessment: a graduate level course, J Expos Anal Environ Epidemiol 1, 271-281, 1991.
17. OSHA, *Field Inspection Manual*, CPL 2.103, 1994.
18. OSHA, *Personal Protective Equipment*, OSHA 3077, 1994.
19. EH Berger, et al. *Noise and Hearing Conservation Manual*, 4th Ed, AIHA, Akron, OH, 1986.
20. M Hagberg, B Silverstein, R Wells, MJ Smith, HW Hendrick, P Carayan, I Perusse. *Work Related Musculoskeletal Disorders (WMSDS): a Reference Book for Prevention*, Taylor and Francis, New York, 1995.
21. L McAtamney, EN Corlett. RULA: A survey method for the investigation of work-related upper limb disorders. Appl Ergonomics 24: 91-99, 1993.
22. MB Pulat. *Fundamentals of Industrial Ergonomics*, Prentice-Hall, 1992.
23. TR Waters, GA Putz-Anderson, LJ Fine. Revised NIOSH equation for the design and evaluation of manual lifting tasks. Ergonomics 36: 749-776, 1993.
24. SS Que Hee, *Biological Monitoring: An Introduction*, Van Nostrand Reinhold/Wiley, New York, 1993.
25. WC Hinds, *Aerosol Technology: Properties, Behavior and Measurement of Airborne Particles*, 2nd Ed, Wiley, New York, 1999.
26. SS Que Hee, *Hazardous Waste Analysis*, Government Institutes, Rockville, MD, 1999.

Trade Magazine

Industrial Hygiene News, <http://www.rimbach.com/rimpub/ihn/ihn.htm>

Occupational Health & Safety, <http://ohsonline.com/Home.aspx>

Some Internet Resources

All start with <http://www>.

Federal Agencies:

OSHA: [osha.gov](http://www.osha.gov)

Centers for Disease Control: [cdc.gov](http://www.cdc.gov)

NIOSH: [cdc.gov/niosh](http://www.cdc.gov/niosh)

EPA: epa.gov

State Agency:

CALOSHA: dir.ca.gov/dir/OS&H/occupational_safety.html

Others:

American Industrial Hygiene Association: aiha.org

American Conference of Governmental Industrial Hygienists: acgih.org

HSDB: <http://gateway.nlm.nih.gov/gw/Cmd?GMResultsSummary%26loc=nccs>

EHS 252G SCHEDULE (Fridays)

April 1: Introduction:

Dr. Que Hee 8a: Gases/vapors, Sampling Strategies, and Biological Monitoring
Reports/Checklists; Regulations/Risk assessment; Public /Environmental Policy

April 8: Introduction (cont'd)

Dr. Kennedy (8a): Personal and area sampling of aerosols, and ventilation strategies; Physical Agents, Indoor Air Pollution, and Thermal Environments

April 22: Interdisciplinary Clinical Field Trip to UCI Occupational Medicine Clinic (will take all day)

April 15,29: **Dr. Que Hee** will focus on gases and vapors field sampling. Aldehydes/ketones and aromatic hydrocarbons in pathology laboratories will be investigated. Students will evaluate the site (pathology laboratory and UCLA hazardous waste bulking facility) in the walkthrough on April 15 with UCLA Environment, Health and Safety. The measurement day is on April 29.

May 6,20: **Dr. Kennedy** will conduct aerosol field sampling, safety, indoor air pollution, physical hazards, and ventilation measurements with a walkthrough on May 6. Field monitoring will occur on May 20.

May 13: SCERC Interdisciplinary trip to Rocketdyne

May 16-19: Portland AIHCE

May 27: First Draft of Reports due in the Instructor mailboxes

May 31 (Tues): Instructors return report drafts with comments

June 3 (Friday) 11:30a-2:30p CHS 41-235: Final examination: Power Point presentation of sampling/analysis sites. Final Written Report due.