EHS 454: Health Hazards in Industrial Processes

Winter 2016

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Lectures: Mondays, 5p – 7p, Room CHS 61-235. 2 hours.

Field Visits: Mondays, 1p-5p unless otherwise indicated. Meet in CHS 61-235 unless otherwise indicated. Off site field trips begin at 1p. UCLA field trips begin at 3p except when notified otherwise.

Lecture Date/Topic /Plant Visit/Date,(Schedule subject to change per facility availability)

The objective of this course is to cover the major unit processes in the workplace relative to exposure hazards, how to integrate anticipation/recognition/identification, evaluation, control, and prevention of them, and to observe and assess specific representative workplace operations to gain an immediate understanding of their potential for excessive workplace exposure(s) to chemicals, physical agents, biological agents, mechanical forces, and stresses from ergonomic and safety situations and their control and future prevention ; to observe and assess workplace operations to determine their potential for injuries related to ergonomics and safety; and to observe and record safety hazards (e.g. unguarded or ineffectively guarded production equipment) or workplace conditions (e.g. wet floors; poor housekeeping; poor records; laterial data sheets are nor present or publically available) that could result in incident or injury.

The environmental health competences covered: C1,C3,C5,C6,C7.

Reports: All field trips require a full field visit report.

01/04 **No Field Trip**; Introduction (surveys, field trips & reports), process flow charts, generalized unit operations, cradle to grave; feedstocks; wastes; recycling;safety; mechanization , logistics, and human factors; checklists; chemical processing. Burgess: pp3-9; 277-302. Batteries (Burgess pp401-408).

01/11 **Trojan Battery Plant site visit.** Smelting ;Metal Working ,Cleaning ,Welding; Burgess pp.13-246; 435-442;458-463; Oil Refining Burgess pp. 303-317;452-457.

01/18: Martin Luther King holiday. No lecture or field trip.

01/25 **Chevron Refinery Field site visit**. Plastics, Composites. Burgess pp 363-371.

02/01 **UCLA Co-Generation Plant** . Plastics, Composites contd. Burgess pp 363-371.

02/08 **UCLA Hazardous Waste Facility (Meet at facility 1p)** . Metal production contd. Burgess pp375-408.

02/15 President's Day holiday. No lecture or field trip

02/22 UCLA Ceramics and Spray Painting Booth Facility (meet 1p 4th floor EH&S office, Strathmore Bldg). Semiconductors Burgess pp375-408.

02/29: **White Wave Foods Field Trip**: Mining and Milling; Burgess 275-276;411-434

03/07: **No field trip**. Catch up and Review.

Mar 14-18: **Oral Examination**. Date, place and time TBA..

Trip reports: They shall be organized per standards discussed in class, and shall include a title page, abstract (one page), introduction, walk through survey details, site map , observations, discussion (operation, hazard, control, what was good, what was bad, opportunities for improvement, prioritized recommendations, relevant hygienic and safety guidelines , references, and appendices .

Reports are due the Monday following the field visit. The body of the field visit report shall be typed, double spaced, and no longer than 5 or 6 pages in length excluding maps and tables.

Final Examination: Oral. The presentation topic shall be chosen randomly at the time of the exam. The presentation will be without notes, however the student can illustrate concepts on the board. The presentation shall include process descriptions, recognized hazards and their control. The instructor will ask questions following the presentation, seeking clarity and the student's appreciation for the most important health and safety risks and their control.

Textbooks:

Burgess, W.A., Recognition of Health Hazards in Industry, 2nd Edition, Wiley-Interscience, New York (1995)—required.

Anna, DH (ed.): The Occupational Environment, Its Evaluation, Control and Management, 3rd edition, AIHA Press, Fairfax, VA 2003. Chapters 30 (Ergonomics); 33 (Occupational Health Psychology); 46 (Confined Spaces); 48 (Hazardous Waste Management); 50 (Occupational Health Programs); 51(Report Writing); 52 (Occupational Safety);

Plog, B.A. and Quinlan, P.J. (eds.): Fundamentals of Industrial Hygiene, 5th edition, National Safety Council, 2002, Chapter 15 (Evaluation), 29 (HIstory of Federal OSHA).