## Division of Environmental and Occupational Hygiene

**Course Goals and Outcomes Form**

**Course number and title:** 26-EIH-905  Identification of Potential Workplace Exposures  
**Graduate Credits:** 3  
**Instructor(s) in-charge:** James H. Jones, CIH  
**Course type (underline all that apply):** Lecture  Laboratory  Field Projects  
**Required or Elective:**

| Course Schedule: (each quarter) | **Lecture:** | _____ hours per week | 3 __meetings  
| **Discussion:** | _____ hours per week | 1 __sessions  
| | | ____ hours for informal discussion  
| **Field Work** | _____ hours per week | 5 hours/each of 6 plant visits  
| **Outside Study:** | _____ hours per week  
| **Office Hours:** | ___as needed_________________  

**Course Assignments:**

| Homework: | _____ assignments  
| Exams: | _____ midterms / finals  
| Reports: | 3-5 __required per quarter (total of 5 in two quarters)  
| Project | _____ required  

**Grading Policy:**

Grade is based on the grading of the survey reports. This in turn is based on the student's ability to understand processes encountered, identify potential hazards, select methods to evaluate whether the potential hazards are "real" hazards in that plant, and the success in transmitting this knowledge in a clear, understandable fashion in the report.

**Course Prerequisites:**

None

**Catalog Description:**

Field trips to representative industrial plants to illustrate principles of industrial operations and methods employed in controlling physical, chemical hazards.

**Textbook and Any Related Course Materials:**

**References:**

- OSHA Standards  
- ACGIH TLVs and documentation; Industrial Ventilation Manual  
- NIOSH Criteria Documents  
- NIOSH and OSHA Sampling and Analytical Methods  
- NIOSH HHE Reports  
Topics Covered:
1. Elements of walkthrough report
2. Conducting a walkthrough
3. Feedback on report

Course Goals (and Program Outcomes):
1. To develop student awareness and general understanding of representative manufacturing/non-manufacturing operations and the potential occupational exposures through walk-observational surveys (A1, B1, B2, C1, C2, D1, D2, D3, D4, D6, J2)
2. To describe the operation and potential exposures in technical reports. (G1, H1, H2)
3. Work as a team and manage resources efficiently (G3, G4)

Evaluation Criteria:
1. Nature and scope of observations made during qualitative walk-through surveys and the technical approach to evaluate potential exposure hazards identified.
2. Written survey report is evaluated on the description of the process observed; exposure hazards observed; and corresponding conclusions.
3. Feedback from instructor during and after the walkthrough.

NOTE: The ABET Program outcome is shown as a capital letter; the number designates the program specific outcome.

Relation to Program Educational Objectives:
This is a required course for all Comprehensive Practice majors. The course contributes to the following Program Educational Objectives, as shown:

<table>
<thead>
<tr>
<th>Fundamental Knowledge</th>
<th>Hygiene Science</th>
<th>65%; Basic Science</th>
<th>Design Skills</th>
<th>Professional Skills</th>
<th>30%</th>
<th>Life-long Learning</th>
<th>5%</th>
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</thead>
</table>

NOTE: EOH faculty define Hygiene Science as all the Knowledge Elements other than the Basic Sciences; Design skills are those necessary to solve real world problems. Professional skills are those that involve teams, management, leadership, written and oral communication, approach to stakeholders and ethics; life-long learning is demonstration of the need for continuing professional development.

Is there a TA? Yes No

Is computer use expected? Yes No

Program outcomes and how they are covered in this course

For each ABET IH Program Outcome (A through L), the EOH Educational Outcomes are shown below. Upon completion of this course, students will have had the opportunity to acquire knowledge (K), skills (S) and attitudes (A) associated with each of the Educational Outcomes, as noted by underlining. Where the educational measurable outcome contributes strongly to the ABET Program Outcome, the K/S/A is shown in upper case; where the contribution is average, the k/s/a is shown in lower case letters. (Note, use the Contribution to Knowledge and Professional Skills estimates above to guide your decision.)

A. Identify agents, factors and stressors generated by and/or associated with defined sources, unit operations and/or processes:
   K S A k s a
   Identify potential health hazards of workplace processes and operations
   K S A k s a

B. Describe qualitative and quantitative aspects of generation of agents, factors and stressors:
   K S A k s a
Describe the underlying processes of the generation of hazards in occupational and environmental settings

Describe qualitative and quantitative aspects of hazards associated with specific occupational or environmental sources

C. Understand physiological and/or toxicological interactions of physical, chemical, biological and ergonomic agents, factors and/or stressors with the human body:

Understand the relation between exposures and health outcomes

Compare and contrast the potential for differences in response to hazards due to personal factors among some subjects at risk of exposure and the subsequent need to modify programs and practices

D. Assess qualitative and quantitative aspects of exposure assessment, dose-response, and risk characterization based on applicable pathways and modes of entry:

Describe how to evaluate potential adverse outcomes of chemical or physical exposures, based on similarity of the exposure to documented hazards

Describe occupational hygiene aspects of emerging technologies

Describe the basic principles of conducting sampling and analysis for exposure assessment

Describe the basic principles of evaluating engineering and non-engineering controls to reduce exposure

Develop and implement an exposure assessment plan to evaluate potential hazards and existing controls

Gather, manage and analyze quantitative (e.g., measurements of exposure or system performance) and qualitative (e.g., written programs) data to evaluate potential hazards and existing controls in order to reduce risk

E. Calculate, interpret and apply statistical and epidemiological data:

Apply epidemiologic and/or statistical concepts to the interpretation of exposure data

F. Recommend and evaluate engineering, administrative and personal protective equipment controls and/or other interventions to reduce or eliminate hazards:

Identify and recommend appropriate methods to reduce exposure (using engineering controls, personal protective equipment or administrative controls), or deficiencies in written programs and policies

Design work process/practice interventions

G. Demonstrate an understanding of applicable business and managerial practices:

Produce accurate oral and written reports, including descriptions of occupational processes and activities, exposure assessment plans and
evaluation of occupational and environmental work settings
Describe approaches to interact with higher-level decision makers in various management structures
Manage resources effectively
Display effective leadership

H. Interpret and apply applicable occupational and environmental regulations:
   Understand, interpret and apply occupational and environmental regulations
   Apply guidelines, standards and laws in interpreting qualitative and quantitative data for exposure assessment for risk characterization

I. Understand fundamental aspects of safety and environmental health
   Apply the professional code of ethics to a scenario

J. Attain recognized professional certification
   Explain the importance of ethics in the practice of occupational and environmental hygiene
   Understand the need for and resources available for continuing professional development after graduation
   Describe the requirements to obtain professional certification

K. Conduct a research activity resulting in a report that demonstrates mastery of the subject and high level of professional and public communication skills
   Design a research question, develop a plan and conduct research
   Communicate effectively with a variety of stakeholders (e.g., labor, management, government, peers, safety and health professionals, allied professionals)
   Produce a technical scientific report on research

L. Demonstrate advanced qualitative and quantitative problem-solving skills
   Function effectively as part of a multidisciplinary team to investigate and propose a solution to an exposure hazard in a workplace

COURSE MATERIAL AND AVAILABILITY

<table>
<thead>
<tr>
<th>Course Goals/outcomes</th>
<th>Students</th>
<th>Instructor(s)</th>
<th>TA</th>
<th>Division</th>
<th>Department</th>
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<td>Lecture notes, assignments</td>
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<td>Instructor response/actions to evaluation comments</td>
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NOTE: Students provide feedback on individual courses through the end-of-class Department and Division evaluation survey instrument. This instrument provides feedback on the course material, organization and presentation, and perceived contribution of the course to the achievement of Program Outcomes. In addition, feedback is received from the continuing, semi-annual Question-feedback process during which students identify Best Learning Experience, Session/presentation that was an endurance test, What would make life as a student better?, If I could do it over, I would…, Opportunities I would like to have but don’t seem to be available, Opportunities I would like more of, Aspects of the program the faculty should consider eliminating, Worst part of the UC program, Best part of the UC program, Other comments. A Ph.D. and M.S. student participate in Division faculty meetings. Exit surveys are conducted by the University and the Division as part of the requirements for graduation. All students are urged to participate fully in each of these activities in order to improve the educational experience.