

## **OESM101: INTRODUCTION TO OCCUPATIONAL SAFETY AND HEALTH**

**TUESDAY 5:00-7:50 P.M.; BLDG. 5, RM. 204**

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Office Hours: Tuesday, 3:30-4:45 pm; Saturday, 6:30-7:00 am

### **Course Description:**

An overview of the development and implementation of safety and health principles in the workplace. The class introduces accident prevention concepts, hazard identification and evaluation methods, investigation and reporting techniques, recordkeeping, environmental management, workers' compensation principles, and a survey of relevant regulations and professional guidelines.

### **Course Objectives:**

Upon completion of the course, students are expected to be able to:

- Discuss the effects of workplace accidents and reasons for accident prevention
- Identify/assess common work-related hazards and recommend appropriate control measures
- Describe the roles of governmental agencies, businesses, and safety professionals in ensuring the safe and healthful work environment.
- Examine potential ethical issues for health and safety professionals
- Demonstrate an ability to work together through various group assignments

### **Textbook:**

Goetsch D.L. *Occupational Safety and Health for Technologists, Engineers, and Managers*. 2008. Sixth Edition. Prentice-Hall, Inc.

Students are expected to read the assigned chapters **prior to** class. See Page 4 for a list of weekly assigned chapters.

## Student Evaluation:

Students are expected to complete **all** of the following:

Homework I (Ethics & Safety)	20 points
Homework II (Safety Inspection)	20 points
Two quizzes (matching & short answers)	15 points each
Final examination (multiple-choice)	85 points
Group project:	
Paper (15-20 typewritten pages)	25 points
Oral presentation (15-20 min)	20 points
Bonus points: Mini-presentation	5-15 points

### *Assignment Rules:*

1. All assignments submitted must be typewritten, single-spaced. Hand-written assignments will not be accepted.
2. Only hard copies are accepted, no electronic submission.
3. If an assignment is submitted after the due date, two points will be subtracted for each late (calendar) day. Assignments submitted later than 5 calendar days after the due date will not be accepted.

### ⊗⊗⊗ **Plagiarism is ground for expelling** ⊗⊗⊗

*Plagiarism:* Taking writings (phrases, sentences, paragraphs, etc) from another and pass them off as one's own.

If direct quoting is unavoidable, use quotation marks (".....") and provide source immediately after the quote. Direct uses of illustrations, diagrams, photographs and other graphic images are considered plagiarism as well. If unavoidable, cite the source of the image.

*Grading:*     **A:** 180-200     **B:** 160-179     **C:** 130-159     **D:** 100-129     **F:** <100

Final grades are permanent. Final "I" grades will not be allowed in this class. Final "N" grades will be given only in very rare and exceptional cases.

### *HCC Grading Policies:*

- a. *No Show Policy.* Students must attend both of the first two class sessions of the semester or may be dropped unless they notify the instructor or the Division Chair in advance of their absence.
- b. *Disappear Policy.* Students may receive an "F" grade if they do not officially drop their course by the drop deadline listed in the Academic Calendar of the current HCC catalogue or the schedule of classes.

### **Emergency Procedures:**

- a. *Location of first aid kit:* In the back of classroom near the Diamond Head door.
- b. *Evacuation of building:* Use Diamond Head and Ewa stairs and proceed to parking lot #2 (by the cafeteria). Assemble and wait for further instructions from the instructor.
- c. *Accident or Injury:*
  1. Call 911 for an ambulance. Give essential information:
    - Location - building, room number, and road to enter campus
    - Type of emergency and victim's condition
    - Your name and phone number
  2. Call Security, 284-1270 or 271-4836:
    - To notify about the incident and request assistance

### **Services for Students with Disabilities:**

Students with disabilities may obtain information on available services online at [honolulu.hawaii.edu/disability](http://honolulu.hawaii.edu/disability).

For specific information, contact Student ACCESS at 844-2392, by e-mail at [access@hcc.hawaii.edu](mailto:access@hcc.hawaii.edu), or by visiting the Student ACCESS Office in Bldg. 7, Room 319.

### **Studying Tips:**

- Read the assigned chapter(s) and review the handout before coming to each class.
- Take notes during the lecture. Do not hesitate to ask questions. If missing a class, borrow lecture notes from a classmate.
- Spend at least two hours, after each class, reviewing the class materials and answering questions listed in the attached "OESM 101: Expected Competencies Topic" (pages 5-10).
- Contact the instructor as soon as possible if there is any question or concern.
- Start working on the assignments as soon as they are given. For group assignments, divide the work among the group's members and specify deadlines. Contact the instructor as soon as possible if group's members are not cooperating.

## OESM 101: Introduction to Occupational Safety and Health

WEEK	TOPIC	CHAPTERS*	NOTES
1	Introduction	1 & 2	
2	Library Session: <i>Meet at the library 5 pm</i>		
	Ethics & Safety	26	Distribute Homework 1
3	Legal Aspects	6	
4	Academic Counselor: Marilyn Ito-Won Coop Ed Coordinator: Ken Johnson		
	Scientific Background	(Hand-out)	Homework 1 due
	Project Assignment		Form teams, select topic
5	<b>Quiz 1</b> (30 min)		<b>Covers weeks 1-4</b>
	Hazard Analysis	27	
6	Accident Investigation	8	Distribute Homework 2
7	Mechanical Hazards	14	
	Electrical Hazards	18	
8	Chemical Hazards	20	No bonus presentation
	Biological Hazards	24	
9	Falling & Lifting Hazards	10	
	Ergonomics	15	
10	<b>Quiz 2</b> (30 min)		<b>Covers weeks 6-9</b>
	Recordkeeping	(Hand-out)	Homework 2 due
11	Workers' Compensation	7	
12	Personal Protective Equipment (PPE)	(Hand-out)	
13	PPE (continued)	(Hand-out)	Group Project due
14	Safety Program Management	(Hand-out)	
	Review		
15	<b>Project Presentations</b>		
16	<b>Final Exam</b>		<b>Covers weeks 1-13</b>

\* Reading assignments prior to class, *Occupational Safety and Health for Technologists, Engineers, and Managers* by D.L. Goetsch. 2008.

## OESM 101: Expected Competencies by Topic

TOPIC	COMPETENCIES	
	KNOWLEDGE	SKILLS
Introduction	<p>Define types of accidents and give an example for each type.</p> <p>Describe the following occupational disasters: Triangle Shirtwaist Factory Fire, Death Calendar, Gauley Bridge incident.</p> <p>Explain the major reason for accident classification.</p> <p>Explain the difference between direct and indirect accident costs.</p> <p>List five items considered indirect accident costs.</p> <p>Name two historical figures that pioneered the field of occupational safety &amp; health. Give examples of their accomplishments.</p> <p>Explain the difference between “acute” and “chronic” diseases.</p> <p>Explain how the industrial revolution affected workers’ health and safety.</p> <p>Explain the common law in regards to employers’ responsibility for work-related injuries.</p>	
Library class		Use available library resources to obtain information needed for class assignments.
Ethics & Safety	<p>Define “ethics”.</p> <p>Name at least three ethical behavior guidelines and briefly describe how each guideline is used to determine whether the behavior in question is ethical.</p>	
Homework 1		<p>Analyze a given scenario to identify:</p> <ul style="list-style-type: none"> <li>• Potential ethical issues,</li> <li>• Potential violations of the Codes of Professional Ethics,</li> <li>• Direct and indirect costs of the accident,</li> <li>• Causes of the accident, and,</li> <li>• Actions that could have been taken to prevent the accident.</li> </ul>

### OESM 101: Expected Competencies by Topic (continued)

TOPIC	COMPETENCIES	
	KNOWLEDGE	SKILLS
Legal Aspects	<p>Identify federal and state agencies responsible for various functions in occupational/environmental health &amp; safety.</p> <p>Explain the significance of the “Federal Register” and “Codes of Federal Regulations” publications to a safety professional.</p> <p>Name the three branches of HIOSH and the functions of each branch.</p> <p>Discuss the rights of employers when visited by a HIOSH compliance officer.</p> <p>State HIOSH compliance inspection procedures. Describe the actions that must be taken by a HIOSH compliance officer when he/she encounters an imminent danger during a compliance inspection.</p> <p>Name three items that are required, by HIOSH, to be posted at work.</p> <p>Define the “OSHA Incidence Rate”.</p>	<p>Calculate the annual OSHA Incidence Rate.</p> <p>Calculate accident cost per manhour.</p>
Scientific Background	<p>Define the following air contaminants: gas, vapor, mist, smoke, fume, &amp; smog.</p> <p>Describe routes of entry.</p> <p>Explain how a dose-response curve is obtained.</p> <p>Explain the meaning of “LD<sub>50</sub>”</p> <p>Give an example for each type of hazard control: at the source, along the path, at the worker.</p>	
Group Project		<p>Select team members &amp; topics.</p> <p>Determine communication means among group’s members. Exchange contact information.</p> <p>Assign chapters and determine deadlines for the outline and drafts.</p> <p>Work together as a team to prepare a written project on the selected occupation, its associated hazards, and hazard control methods.</p> <p>Conduct an oral presentation based on the written project.</p>

### OESM 101: Expected Competencies by Topic (continued)

TOPIC	COMPETENCIES	
	KNOWLEDGE	SKILLS
Hazard Analysis	<p>State the full name for the acronym FMEA.</p> <p>Explain how FMEA is used to prevent mishaps.</p> <p>Explain the purposes and processes: Job Safety Analysis, Fault Tree Analysis</p>	<p>Conduct a Job Safety Analysis and Fault Tree Analysis to identify potential accident causes and preventive measures.</p>
Accident Investigation	<p>Describe appropriate steps used to investigate workplace accidents and briefly describe each method.</p>	<p>Conduct witness interviews based on a given scenario.</p> <p>Analyze the information obtained from the interviews to determine:</p> <ul style="list-style-type: none"> <li>• Possible causes of the accident</li> <li>• Preventive measures</li> </ul> <p>Identify strengths and weaknesses of the methods used to interview witnesses.</p> <p>Discuss good interviewing techniques.</p>
Homework 2		<p>Develop an inspection checklist based on selected HIOSH standards.</p> <p>Conduct a workplace inspection using the checklist.</p>
Mechanical Hazards	<p>Describe characteristics of effective machine guarding.</p> <p>List types of machine guarding systems. Give two examples for each type.</p>	<p>Identify hazards from photos of workplaces.</p>

### OESM 101: Expected Competencies by Topic (continued)

TOPIC	COMPETENCIES	
	KNOWLEDGE	SKILLS
Electrical Hazards	<p>Explain the lockout/tagout procedures.</p> <p>Define the following terms: electricity, electrical current, resistance, electrical circuit, insulator, and conductor.</p> <p>Use the Ohm's Law to explain the relationship among current (Ampere), resistance (Ohm), and potential difference (Volt).</p> <p>Name the agency that publishes the National Electric Code.</p> <p>Explain the purpose and procedures of "bonding and grounding".</p> <p>Name three instruments used to test for safety of electrical equipment.</p> <p>Explain the purpose of GFCI and how GFCI functions.</p> <p>Name the four types of fire extinguishers and explain each type.</p>	
Chemical Hazards	<p>Define the following terms: irritant, sensitizer, narcotic, carcinogen, and asphyxiant. Give two examples for each.</p> <p>Explain the difference between simple and chemical asphyxiants.</p> <p>Give two examples each for simple and chemical asphyxiants.</p> <p>Define the following terms: PEL, TLV, IDLH, flash point, LEL, UEL</p> <p>Select the type of hazard that is covered under the Hazard Communication standard (HazCom): chemical, biological, physical.</p> <p>Explain the purpose of MSDS and name one HIOSH standard that requires MSDS. Name five items of information listed on the MSDS.</p>	Use the MSDS to identify hazards and protective measures.
Confined Space	<p>State the HIOSH's definition of "confined space".</p> <p>Name the four conditions, under the OSHA Confined Space Entry standard, that prohibit employees from entering a confined space.</p>	Determine whether an confined-space entry is allowed based the given information
Biological Hazards	Discuss the HIOSH standard that addresses HBV & HIV exposure controls?	

### OESM 101: Expected Competencies by Topic (continued)

TOPIC	COMPETENCIES	
	KNOWLEDGE	SKILLS
Falling & Lifting Ergonomics	<p>Explain how a safety professional use the “coefficient of friction” values.</p> <p>Name the risk factors for MSDs (CTDs).</p> <p>Give three examples of MSDs (CTDs).</p> <p>Describe the disorder, Carpal Tunnel Syndrome (CTS). Name three ways to prevent CTS.</p>	
Recordkeeping	<p>Name the requirements for OSHA 300 recordkeeping, including:</p> <ul style="list-style-type: none"> <li>• Types of businesses required to maintain OSHA 300</li> <li>• Forms used</li> <li>• Criteria for recordable cases</li> <li>• Maintaining OSHA 300</li> </ul>	<p>Correctly complete OSHA 300 and OSHA 300A forms based on the information given.</p>
Workers' Compensation	<p>Name the objectives and scope of the Workers' Compensation law.</p> <p>List costs covered under the Hawaii Workers Compensation Law.</p> <p>Explain the purpose of TDI.</p> <p>Explain the meaning of the term “exclusive remedy” listed in the Hawaii Workers Compensation law.</p> <p>Explain these terms: PPD, PTD, TTD</p> <p>Discuss how the Common Law defenses were used to limit employers' liability to workers' injuries and illnesses.</p>	

### OESM 101: Expected Competencies by Topic (continued)

TOPIC	COMPETENCIES	
	KNOWLEDGE	SKILLS
Personal Protective Equipment	<p>Discuss the priority of hazard controls as required by HIOSH.</p> <p>Name the agency that establishes criteria for head/eye/face/foot protection. (These criteria are adopted by OSHA.)</p> <p>Name the types of respirators. Briefly explain each type.</p> <p>Name the type(s) of respirator(s) required when entering an oxygen-deficient atmosphere?</p> <p>Explain the difference between “fit test” and “seal checks”.</p> <p>Explain the meaning of “NRR”.</p> <p>Explain the “minus seven rule”.</p>	<p>Select appropriate types of respirators for given workplace scenarios.</p> <p>Inspect and maintain a half-face air-purifying respirator.</p> <p>Conduct a qualitative fit-test for a half-face air-purifying respirator</p>
Safety Program Management	<p>Name the criteria for an effective health and safety program.</p> <p>Explain how a safety accountability system can improve the effectiveness of a safety program.</p> <p>Distinguish between the “Result Objective” and Activity Objective”. Explain how they can be used to measure personnel’s safety performance.</p>	<p>Assess a company’s safety performance based on the given scenario.</p> <p>Calculate incidence rate and accident cost per manhour.</p> <p>Develop an activity plan to improve the company’s safety performance</p> <p>Develop short- and long-term objectives for the planned activities.</p> <p>Determine means to measure effectiveness and progress of the safety program.</p>
Project Presentations		<p>Work together as a group to plan and conduct a presentation focusing on a specific topic covered by the written project.</p>