

OEH:5410 – Occupational Safety (3 credits)
Spring xxxx
MW 3:20-4:50
xxxx CPHB –

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Office Hours: Wednesdays 1:30-2:15 or by appointment

Time: M, W 3:20-4:50

Location: CPHB xxxx

Text: Safety and Health for Engineers, xx Edition, Roger L. Brauer, John Wiley & Sons, Inc., Hoboken, NJ, 2006

Additional readings for each lesson are posted on ICON.

Course Description: This course covers the principles and practices of Occupational Safety. Specific applications in industrial and other occupational settings are presented, and interactions with other disciplines are emphasized.

Course Objectives: This is an introductory course to occupational safety. It meets twice per week to review key lesson materials and to undertake activities focused to build skills in hazard identification, hazard remediation, and data analysis. Weekly activities reinforce information learned and provide additional opportunities to demonstrate the ability to apply this knowledge. At the end of the course, students will be able to: (1) identify and understand fundamental safety standards, (2) identify common safety hazards and recommend remediation, (3) track and trend injury statistics, (4) understand the basics of behavioral based safety, and (5) investigate near misses and injuries on the job.

Grading: Grades will be based on 2 exams (2 take-home; in-class cumulative final), pre-session quizzes, discussion board activities, and two projects (site safety consultation paper and presentation; training package).

Activity	Points
Exam 1	100
Exam 2	100
Pre-session quizzes (10@5)	50
Site Safety Consultation – Presentation	25
Site Safety Consultation – Paper	100
Safety PSA – “Presentation”	50
Total	425

Standard letter grades will be assigned, using: A = 90 -100%, B=80-89%, C=70-79%, D=60-69%, F=<60%

Exams - Two exams (100 pts each) will be provided as an opportunity to demonstrate you have understood the course information and can demonstrate its application. These are problem sets that will have three components:

- General information (e.g., 25 points)
- Data synthesis (e.g., 30 points)
- Design question, incorporating multiple lessons (e.g., 45 points)

The take-home exams are NOT multiple-choice. Some exams may include multi-media, and videos will be in Windows-accessible formats. Students are encouraged to *download the exam as soon as possible* and verify access to multi-media files early. The instructor will make every attempt to respond quickly to accessibility problems quickly in the first half of the exam week. Files in the same formats are available in lesson materials, and problems with accessibility should be resolved well before the exams are posted. The final exam is an in-class exam (short answer, multiple choice, etc.) and is cumulative but does have increased focus on the sessions after the second exam. It is *highly recommended* to include a review of comments on your midterms to prepare for the final.

Pre-Session Quizzes (50) - For each lesson topic, you must complete a 5-question quiz, accessible on ICON, prior to class time (by 2 pm class days). While there are 12 topics scheduled throughout the course of the semester, there will be 11 quizzes (lessons 1 & 2 will be combined) and only your **top 10 scores** will be used (even though ICON will keep track of all quizzes taken, the final grade will be adjusted). You are allowed to take a session's quiz *twice*. However, the second attempt will likely erase your first score and, because there are more than 5 questions in each session's bank, you will likely see different questions. Re-taking a quiz without preparing for it is your risk.

Discussion Board (none) – A portion of class time each week will be spent collecting data or making observations on items related to each lesson material. So that your data doesn't gather in your notebooks, unanalyzed, there are weekly "Activity Discussion Boards" where data will be uploaded. There is also a series of *discussion boards* linked to specific questions in the Lesson Readings, with one set for each of the course lessons (12). *While not graded*, participation will help you prepare for the exams (you will be using spreadsheets, testing forms, and applying materials to case studies). **Bonus points** will be provided for completing *ONE activity synthesis* per semester (two points) and for weekly discussion boards (1 point per week, max, assigned based on count (at least 2 postings for at least 2 questions) and quality (substantial information or analysis provided): these points will supplement less than desirable performances on the weekly quizzes. These will be tabulated after exams for materials covered before the exams. To keep up with the course, these discussions should be completed *within one week* following the live lesson in class. A topic sign-up for activity synthesis will be posted at the start of the "Activity Discussion Board" so you can call dibs on the role of synthesizing the week's activity (a max of 2 per week can sign up per topic).

Site Safety Consultation (25 / 100) – Students will adopt a small business in town (or near your home) and perform safety consultation services for them. A report (100 points) and a presentation (25 points) are required. Details of this project are explained, in full, in the ICON Assignments folder. In brief, each student will generate a report that includes an emergency action plan and two interventions specific for their selected site, in fitting with the topics we are studying this semester. With approval, two students may work together at one site (in which a total of five interventions must be completed, along with an emergency action plan).

Safety Training / PSA (50) – To understand how safety professionals have to be "experts" on many safety topics, each of you will prepare a 3-5 minute safety "training" presentation to be viewed by all in the course. The topics do *not* have to match the topics on the syllabus. However, you may wish to focus your training program on a specific hazard pertinent to your site safety consultation (but this is not required). This does not count toward the required two interventions, above.

Details of these assignments and their grading rubrics are provided in the course materials posted on ICON.

Class meetings use the following format: (1) review students' questions from previous week; (2) provide a short presentation on the key issues of the assigned topic reading; (3) participate in a facilitated discussions on questions imbedded into the lesson reading pdfs; and (4) complete an interactive case study to apply theory. It is *imperative* that reading is completed before class begins. BECAUSE we will rely on a lot of on-line information, you may wish to bring a laptop to class to better participate in classroom activities (and walk away with products that will help you on take-home exams).

Icon contains the course Lessons (pdfs) to be read before class and quizzes to be completed prior to a lecture that reviews the key points of the readings. The Lesson pdfs have discussion questions, some of which we will discuss in class, others of which will be discussed on line with your peers. These boards, as mentioned previously, contain questions that will help you develop skills and vocabulary to do well on exams. While they provide only bonus points to supplement quiz performances, do not overlook their value to your success in this class.

Bring the Lesson text with you (electronic or hard copy): no PowerPoint handouts will be provided. You will want to take notes on your lesson materials. Supplemental information on websites and in the primary text book (SHE=Safety and Health for Engineers, R.L. Brauer) are also required reading. Be familiar with the web sites, because you will need them for completing the take-home exams.

Housekeeping -

Administrative Home

This course is given by the College of Public Health. This means that class policies on matters such as requirements, grading, and sanctions for academic dishonesty are governed by the College of Public Health. Students wishing to add or drop this course after the official deadline must receive the approval of the Associate Dean for Academic and Student Affairs in the College of Public Health. Details of the University policy of cross enrollments may be found at:

<http://www.uiowa.edu/~provost/deos/crossenroll.doc>

Electronic Communication

University policy specifies that students are responsible for all official correspondences sent to their standard University of Iowa e-mail address (@uiowa.edu). Students should check this account frequently.

Availability of Accommodations for Students with Disabilities

Any student eligible for and needing academic adjustments or accommodations under the Americans with Disabilities Act is requested to notify the instructor as soon as possible to make appropriate arrangements.

<http://www.uiowa.edu/~sds/accommodations-services/index.html> .

Academic Misconduct

*Academic misconduct, including plagiarism and any other activities when students present work that is not their own, is defined in the University of Iowa Code of Student Life, which clearly defines academic misconduct (1.1a) found at: <http://www.uiowa.edu/~our/opmanual/iv/01.htm>. **It is the student's responsibility to seek clarification from the course instructor of any situation in which he/she is uncertain whether academic misconduct is/has been involved.***

Academic misconduct is a serious matter and is reported to the departmental DEO and to the Associate Dean for Education and Student Affairs. Instructors and DEOs decide on appropriate consequences at

the departmental level while the Associate Dean enforces additional consequences at the collegiate level. For example, an incident involving plagiarism will result in consequences to the student ranging from a grade of 0 for that assignment to being terminated from his/her graduate program. Egregious acts of misconduct, such as cheating on a final exam, may result in the course grade being reduced to an F.

Additional information on academic misconduct is available at <http://dos.uiowa.edu/policy-list/current/student-responsibilities-6/academic-misconduct-6/> Additional details concerning the consequences associated with acts of plagiarism, including a student appeals process, is provided in the Graduate College Manual section IV.F.

Academic Misconduct includes but is not limited to the following:

- presentation of ideas of others without credit to the source;*
- use of direct quotations without quotation marks and without credit to the source;*
- paraphrasing without credit to the source;*
- participation in a group project which presents plagiarized materials;*
- failure to provide adequate citation for material obtained through electronic research;*
- downloading and submitting work from electronic databases without citation;*
- submitting material created/written by someone else as one's own, including purchased term/research papers;*
- copying from someone else's exam, homework, or laboratory work*
- allowing someone to copy or submit one's work as his/her own;*
- accepting credit for a group project without doing one's share;*
- submitting the same paper in more than one course without the knowledge and approval of the instructors involved;*
- using notes or other materials during a test or exam without authorization;*
- not following the guidelines specified by the instructor for a "take-home" test or exam.*

Classroom Behavior:

General: The ability to learn is lessened when students engage in inappropriate classroom behavior, distracting others; such behaviors are a violation of the Code of Student Life (<http://student-services.uiowa.edu/students/policies/2a.php>)

Cell Phones & Pagers: Set cell phones and pagers on vibrate prior to entering class. Do not speak on the phone in class. Leave the room if you must speak with someone.

Concerns about Faculty Actions

Students who have a concern about a faculty action should first address the issue with the instructor, then the course supervisor (if there is one), and then the departmental DEO. Students may also contact the Associate Dean for Education and Student Affairs in the College of Public Health. Another resource for students is the Office of the University Ombudsperson. If a complaint cannot be resolved at the departmental and/or collegiate level, students may file a formal complaint utilizing the procedure specified in the [Operations Manual \(II-29.7\)](#)

Nondiscrimination Statement

The University of Iowa prohibits discrimination in employment, educational programs, and activities on the basis of race, national origin, color, creed, religion, sex, age, disability, veteran status, sexual orientation, gender identity, or associational preference. The University also affirms its commitment to providing equal opportunities and equal access to University facilities. For additional information on nondiscrimination policies, contact the Office of Equal Opportunity and Diversity, (319) 335-0705.

Understanding Sexual Harassment

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty,

and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Operations Manual for the full University Policy:
<http://www.uiowa.edu/~our/opmanual/ii/04.htm>

Reacting Safely to Severe Weather

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Public Safety web site: visit <http://hawkalert.uiowa.edu/>

WEEK#	TOPIC
1 Jan. 22	<p>Lesson 1: Introduction and Vocabulary</p> <p><i>Learning Objectives:</i></p> <ul style="list-style-type: none"> - Understand the course expectations - Begin developing a safety vocabulary - Understand where and why current regulations have evolved - Identify knowledge and skills needed in the safety field - Begin to look at your surroundings with new eyes <p><i>Readings:</i> SHE Ch. 1, 2, 3, 4 begin reading for next lesson as soon as possible</p> <p><i>Activity:</i> How safe is a room? What regulations/guidelines might we want to consult (Ch. 4)?</p>
2 Jan 27/29	<p>Lesson 2: Case Studies – A Motivational Moment</p> <p><i>Pre-class Preparation:</i> Read through the Lesson and web links. Consider bringing copies of the web site information (electronic / hard) to class, or bring your laptop with the information downloaded. Focus on discussion questions before arriving.</p> <p><i>Learning Objectives:</i></p> <ul style="list-style-type: none"> - Understand where we “started”... and how far we have come? - Identify incident report format and details - Observe the components of incident investigations come together - Understand that regulations don’t make a workplace safe - Be motivated to learn the details of fire protection <p><i>Activity:</i> Most of this class is devoted to discussions and exercises evaluating these incidents</p> <p><i>Readings:</i> Refer to links in the Lesson materials. (No text chapter.)</p>
3 Feb 3/5	<p>Lesson 3: Fire Protection, Emergency Evacuation, Emergency Response</p> <p><i>Pre-Class Preparation:</i> Read through the Lesson and web links. (1) From your readings, make bullet list of what you would audit to verify compliance (we will roll this list up and use it). (2) Bring one case study (FACE investigation report, etc.) that we will evaluate. Select one that is not incorporated into this lesson’s reading.</p> <p><i>Case Study:</i> Categorize case studies by fire source</p> <p><i>Learning Objectives:</i></p> <ul style="list-style-type: none"> - Understand the basic chemistry of fires - Demonstrate factors that contribute to industrial fires - Understand the basics of fire protection systems and their maintenance and operation - Understand the requirements of emergency evacuation plans <p><i>Activity:</i> Compile fire protection requirements into checklist; use the list</p> <p><i>Readings:</i> SHE Ch. 16, 17, 12. Additional reading with Web links are on ICON.</p>

- 4 Feb 10/12 Lesson 4: Walking/Working Surfaces; Slips, Trips and Falls; Fall Protection**
Pre-class Preparation: Read through the Lesson and web links. Identify a fatality or injury case (not in the lecture materials) to bring to class.
Learning Objectives:
- Understand the detailed focus of prescriptive standards
 - Identify observable WWS hazards
 - Explain what happens when a “professional” walks by hazards without acknowledging it
 - Identify selection, use, and limitations of fall protection
- Activity:* Compile class information on fall fatalities/injuries and look for trends; work on recognition skills by identify hazards from video/image review of sites with hazards; fall protection demonstration.
Readings: SHE Ch. 9, 11, 28-9. Additional reading with Web links are on ICON.

NOTE: Sites/teams must be finalized for Consultation project (post in ICON) by 5 pm of Day, **Feb. 14**

- 5 Feb 17/19 Lesson 5: Lockout/Tagout**
Pre-class Preparation: Read through the Lesson and web links. Focus on steps required to prepare a LOTO procedure.
Learning Objectives:
- Identify key aspects of LOTO procedures
 - Demonstrate the application of the standard through case studies
 - Identify tools needed for a LOTO program to function effectively
- Activity:* Lock Box demonstrations; demonstrate LOTO process for a piece of equipment brought to class.
Readings: SHE Ch. 12, 13-6, 37-8, Additional reading with Web links are on ICON.

Week 6: Take Home Exam #1 (100) (Feb 24-26)

- 7 Mar 3/5 Lesson 6: Machine Guarding**
Pre-class Preparation: Read through the Lesson and web links. Identify MG checklist and be prepared to group to
Learning Objectives:
- Understand the basics of machine guarding
 - Recognize machines that need guarding and guarding improvements
 - Demonstrate ABBI concepts and guarding scale use
 - Explain why guarding is necessary
 - Identify types of injuries consistent with inadequate machine guarding
- Activity:* Use MG tools to conduct an instructor-led MG survey on a piece of equipment. Identify information you want to record for your field trip. Class time will be set aside to allow teams to prepare for MG Survey field project, including assigning sections of paper to write up and consensus agreement to forms your team will use.
Readings: SHE 13, Additional reading with Web links are on ICON.

- 8 Mar 10/12 Lesson 7: Confined Spaces**
Pre-class Preparation: Read through the Lesson and web links. Everyone is to bring an example Confined Space Permit (from web, work, etc.)
Learning Objectives:
- Determine whether a space is a Confined Space
 - Identify types of hazards associated with a confined space
 - Describe atmospheric testing requirements
 - Develop a confined space permit
 - Relate lockout/tagout and machine guarding standards to the confined space standard.

Activity: CSPermit review

Readings: SHE Ch. 24-7. Additional reading with Web links are on ICON.

March 17/19: Spring Break (no meetings)

9 Mar 24/26 Lesson 8: Incident Investigations

Pre-class Preparation: Read through the Lesson and web links. Identify and **bring** with you one accident/incident/near miss case study to evaluate during the class; download the forms on Icon.

Learning Objectives:

- Understand the importance of investigating incidents
- Understand the role of others in completing investigations
- Develop skills to identify root causes
- Develop recommendations and prioritize corrective actions

Activity: We will apply each different investigation method to case studies, including Kinston explosion (see videos posted).

Readings: SHE Ch 36, 37. Additional reading with Web links are on ICON.

10 Mar 31/Apr 2 Lesson 9: Powered Industrial Trucks

Pre-class Preparation: Read through the Lesson and web links. Find video links to PIT incidents for classroom activity.

Learning Objectives:

- Understand the severity of injuries associated with powered industrial trucks (PITs).
- Identify common causes of incidents and injuries with PITs
- Identify key elements to protect workers on PITs
- Explore the role of supervisor in safety efforts
- Identify other material handling hazards

Activity: Review videos and case studies. Track and trend root-causes: What is the most common contribution to the injury? What should we address in this “population” first?

Readings: SHE Ch 15, Additional reading with Web links are on ICON.

11 Apr 7/9 Lesson 10: Personal Protective Equipment

Pre-class Preparation: Read through the Lesson and web links. See activity.

Learning Objectives:

- Explain hazard control hierarchy
- Understand components of an effective PPE program
- Identify hazards that can be protected with PPE
- Identify the benefits and limitations of different PPE
- Understand criteria applicable to PPE selection

Activity: Complete a hazard assessment for a job task (task details will be posted)

Readings: SHE Ch. 28; Additional reading with Web links are on ICON.

- Understand the differences between Workers Compensation vs OSHA Recordkeeping
- Demonstrate the use of safety statistics to “sell safety” to worksites

Activity: We will review cases, complete logs, compute rates.

Readings: SHE Ch. 6 and 8. Additional reading with Web links are on ICON.

NOTE: **Safety Training / PSAs due on ICON by end of day, April 11.** Check back on ICON to complete your review of TWO of your fellow student packages by **May 2.**

Week 12: Take Home Exam #2 (100) (Apr 14/16)

- 13 Apr21/23 Lesson 11: Reporting Injuries/Illnesses, Workers' Compensation, OSHA Inspections**
Pre-class Preparation: Read through the Lesson and web links. Download the OSHA 300 log excel spreadsheet and begin to play with entering case information (start with cases in the lecture).
Learning Objectives:
- Identify whether an injury is "recordable"
 - Understand how to compute key safety metrics

- 14 Apr 28/30 Lesson 12: Behavioral Based Safety; Safety Management**
Pre-class Preparation: Read through the Lesson and web links. Become familiar with key behavior terminology.
Learning Objectives:
- Understand the purpose and structure of a BBS system
 - Learn how to analyze injury statistics to optimize a BBS for a target population
 - Understand implementation and commitment needed to have a successful program
 - Demonstrate the key behaviors associated with injuries
 - Understand how BBS fits into an overall safety program
- Activity: Review injury data to customize BBS focus areas for a site*
Readings: SHE Ch. 31, 34, 35; Additional reading with Web links are on ICON.

Peer Reviews of Safety PSAs due on ICON by end of day, May 2.

- 15 May 5/7 Student Presentations – Site Safety Consultation (25 pts for presentation)**
Learning Objectives:
- Demonstrate ability to synthesize standards, apply them to a real site, and recommend preventative measures
 - Demonstrate ability to communicate findings and recommendations to peers
- After presentations, time will be allotted for each team to work on / solicit questions from instructor / class.

Final Papers due on ICON May 9, xxxx at 5 pm (100 pts)
All Discussion Board Activity should be completed by May 9, xxxx at 5 pm