

Occupational Safety Engineering
EIN 6905
Class Periods: M, W, F 3:00-3:50 pm
Location: Via Zoom (Online)
Academic Term: Fall 2020

Instructor:

Name: Boyi Hu
Email Address: boyihu@ise.ufl.edu
Office Phone Number: 352-294-7701
Office Hours: By appointment

Teaching Assistants:

Please contact through the Canvas website

- N/A
- N/A

Course Description

3 credits. Safety history; accident causation; safety organizations and agencies. Approaches to occupational safety and risk management. Product defects and safety program development; product liability; Hazard communication standard; OSHA safety standards and codes; OSHA record keeping; Common occupational hazards; Robotics safety regulations.

Course Pre-Requisites / Co-Requisites

With instructor permission.

Course Objectives

To develop:

- (1) a familiarity with safety and historical litigation;
- (2) knowledge of the pillars of occupational safety and methods for application;
- (3) an understanding of product safety programs and risk management, learn how to design a simple safety program;
- (4) knowledge of hazard communication methods;
- (5) a familiarity with OSHA standards and codes and recordkeeping, knowledge of how to conduct OSHA recordkeeping;
- (6) knowledge of human behavior as related to safety;
- (7) knowledge on industrial hazards and related safety standards;
- (8) familiarity with safety activities related to accidents;
- (9) quantitative accident analysis methods

Materials and Supply Fees

N/A

Required Textbooks and Software

- Safety and Health for Engineers (3rd edition)
- Roger L. Brauer
- Wiley, 3rd edition, 2016
- 978-1118959459

(if course notes are developed by the instructor, so state)

Recommended Materials

- Occupational Safety and Health for Technologists, Engineers, and Managers (9th edition)
- David L. Goetsch
- Pearson, 9th edition, 2018
- 978-0134695815

Course Schedule (tentative)

Week:	Lecturer:	Brauer (2016) Reading and Assignments:	Topics:
1 & 2 Monday, Wednesday and Friday 3:00-3:50 (Week 2 Monday is holiday)	Boyi Hu	Chapters 1, 2 and 3 Extra reading materials prepared by the instructor.	- Introduction and definitions; Injury statistics; History of safety and safety litigation; Safety organizations (professional and certification); accident general principles; tragic workplace accidents; (HW1: accident description essay)
3 & 4 Monday, Wednesday and Friday 3:00-3:50	Boyi Hu	Chapters 9 and 34 Extra reading materials prepared by the instructor.	- Accident causation and statistics; Safety agencies (OSHA, DOL). - Approaches to occupational safety and hygiene; Job safety analysis; Risk management; Risk communication. (HW2: accident causation model essay)
5 Monday, Wednesday and Friday 3:00-3:50 (Week 5 Friday is holiday)	Boyi Hu	Chapter 25 and 26 Extra reading materials prepared by the instructor.	- Respirator safety - OSHA 29 CFR 1910.134 - Miscellaneous

6 Monday, Wednesday and Friday 3:00-3:50	Boyi Hu	Chapter 4-5 Extra reading materials prepared by the instructor.	- OSH Act – General Duty Clause; Standards development; Variances; OSHA reporting; Inspections and citations; Examples; Enhanced Enforcement Policy; Appeals and contests; Employer/Employee rights; Keeping up-to-date. - Safety standards and codes – General Industry and subparts; Maritime and long shoring; Construction and subparts; Standards organizations; ANSI and UL; Continuum of safety terms. (HW3: library assignment)
7 Monday, Wednesday and Friday 3:00-3:50	Boyi Hu	Extra reading materials prepared by the instructor.	Confined Space Safety - Exam Review is on Week 7 Friday
8 Monday, Wednesday and Friday 3:00-3:50	Boyi Hu	Chapter 31 Extra reading materials prepared by the instructor.	Monday and Wednesday: Mid-term Exam Robotics Safety
9 Monday, Wednesday and Friday 3:00-3:50	Boyi Hu		Robotics Safety
10 Monday, Wednesday and Friday 3:00-3:50	Boyi Hu		- OSHA record keeping – Reporting requirements; Logs; Incident rates; Exceptions; Examples. (HW4: record keeping exercise)
11 Monday, Wednesday and Friday 4:05-4:50 (Wednesda y is holiday)	Boyi Hu	Chapter 12 Extra reading materials prepared by the instructor.	- Electrical Hazards – Regulations; Basics of electricity; Shock; Physiological effects; Static electricity; Hazard types; Prevention and insulation; PPE; Guarding; Grounding; Safe work practices; Voltage testing.

12 Monday, Wednesday and Friday 3:00-3:50	Boyi Hu	Chapter 23	Industrial Noise & Vibration Hazards – Definitions; Ear anatomy; Sound properties and pressure; Classes of noise; Combining sources; Measuring sound; Health hazards; Standards and regulations; Guidelines; Dosage calculations; Hearing protection. (HW5: noise assignment)
13-14 Monday, Wednesday and Friday 3:00-3:50 (Week 13 Wednesday and Friday are holiday)	Boyi Hu	Chapter 11	- Fall Hazards and Protection – Types of falls; Causes; Regulations; Walking surfaces and slip measurement; Holes/openings; Guardrails; Stairways; Portable and fixed ladder safety; Fall protection systems; Swing protection; Scaffolding.
15 Monday, Wednesday 3:00-3:50	Boyi Hu	Chapter 16 Semester literature review project due.	- Fire protection – Example incidents; Common myths; Burn classifications; NFPA diamond; Fire triangle; Fire behavior; Fire prevention; Fire load; Vapor volume; Fire classification; Extinguishers; Alarms and hoses; Egress; Safety violations; Types of explosions; Hazards of explosions. - Exam Review is on Friday

Accident description essay assignment: This assignment is intended to familiarize you with the landscape of the major accident in human history. You need to prepare a 1.5-page brief report (single space, 11 font size, minimum 800 words).

Accident causation model essay assignment: This assignment is intended to familiarize you with the commonly used accident causation models in the domain of occupational safety engineering. You need to prepare a 1.5-page brief report (single space, 11 font size, minimum 800 words).

Library assignment: This assignment is intended to familiarize you with available safety resources through the OSHA website and the library. The assignment should also be helpful in preparing you for Exam 1. You will need to visit the OSHA website (www.osha.gov), as well as the University library, in order to complete the assignment.

Recording keeping assignment: Using a copy of OSHA Form 300, determine if the following cases should be logged on the form. If so, enter the appropriate data on the form. This assignment is intended to familiarize you with the OSHA recording keeping methods.

Noise exposure calculations: This assignment is intended to develop your skill in terms of quantify the noise level in complex occupational settings.

Semester literature review project: This project aims to develop your skill of reading academic research articles in different occupational areas and develop your skill of summarizing the key content from them. In addition, literature of different quantitative accident analysis methods will also be reviewed.

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is not required, but strongly recommended. It will be to your benefit to attend all lectures. You will be responsible for everything covered in class. Those who behave inappropriately will be asked to leave. Please turn your cell phone into silent mode. Excused absences are consistent with university policies in the undergraduate catalog (<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance>) and require appropriate documentation.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
In class quizzes, presentations and HW assignments	100	25%
Midterm Exam	100	25%
Literature review project and presentation	100	25%
Final Exam	100	25%
Total		100%

Grading Policy

Percent	Grade	Grade Points
90.0 - 100.0	A	4.00
87.0 - 89.9	A-	3.67
84.0 - 86.9	B+	3.33
81.0 – 83.9	B	3.00
78.0 - 80.9	B-	2.67
75.0 - 77.9	C+	2.33
72.0 – 74.9	C	2.00
69.0 - 71.9	C-	1.67
66.0 - 68.9	D+	1.33
63.0 - 65.9	D	1.00
60.0 - 62.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:
<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades>

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks

of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.

Commitment to a safe and inclusive learning environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination.

It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@ufl.edu

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the Office of Title IX Compliance, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.