Occupational Safety Engineering
EIN6216
Class Periods: M,W,F 11:45-12:35 pm
Location: TUR 2318 (M, W); WEIL 0234 (F)
Academic Term: Fall 2025

Instructor:
Name: Boyi Hu
Email Address: boyihu@ise.ufl.edu
Office Phone Number: 352-294-7701
Office Hours (tentative) M and W 2-4 pm, or by appointment.

Teaching Assistants:
Please contact through the Canvas website

Course Description

You have probably heard phrases like an OSHA violation, worker's compensation, something not being up to code, or the million-dollar lawsuits that are filed after a workplace accident that was caused by the employer's negligence. Worker safety is an integral part of thousands of businesses in the United States and the development of the current safety standards that we have did not come about in a single year or even a single decade. Although you might have a surface level knowledge of worker safety in some respects you might find yourself asking the following questions: What does it mean when something is an "OSHA violation" and how do they get identified? How did these regulations come to be in the first place? What is the process of OSHA inspection? In this 3-credit course, we are going to answer these questions and more giving you an in-depth about workers' safety. Some of the topics we will cover in this class include safety history, accident causation, different safety organizations and agencies, approaches to occupational safety and risk management, product liability, hazard communication standards, workers' compensation, OSHA safety standards, codes, and record keeping and common occupational hazards. We will also learn more about the occupational safety hazards that are caused by emerging technologies such as robotics and the safety standards that are associated with them. By the end of this class, my hope is to equip you with the knowledge to tackle worker safety issues in whatever position you might occupy and advocate for safety in your respective workplaces.

Relation to Program Outcomes (ABET):

Outcome	**Coverage***
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	High
3. An ability to communicate effectively with a range of audiences	

4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	High
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

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;
(10) familiarity with literature in occupational safety field;
(11) learn the new trend in occupational safety and emerging methods.

Materials and Supply Fees

N/A

Course Schedule (tentative)

Week:	Lecturer:	Brauer (2016) Reading and Assignments:	Tentative Topics:
1	Boyi Hu	Chapter 1 Extra reading materials	- Introduction and definitions; Injury statistics; History of safety; Safety organizations

		prepared by the instructor	(professional and certification); Pillars of safety
2	Boyi Hu	Chapters 2 and 3 Extra reading materials prepared by the instructor	- Tragic workplace accidents
3	Boyi Hu	Chapters 4 and 25 Extra reading materials prepared by the instructor	- Ventilation safety - Accident causation and statistics; Safety agencies (OSHA, DOL) - Approaches to occupational safety and hygiene; Job safety analysis; Risk management; Risk communication
4	Boyi Hu	Chapters 4 and 25 Extra reading materials prepared by the instructor	
5	Boyi Hu	Chapter 8 Extra reading materials prepared by the instructor	- OSHA record keeping – Reporting requirements; Logs; Incident rates; Exceptions; Examples

6	Boyi Hu	Chapter 11 Extra reading materials prepared by the instructor	- Falls (same level, fall to a lower level) - Fall Hazards and Protection – Types of falls; Causes; Regulations; Walking surfaces measurement; Holes/openings; Guardrails; Stairways; Portable and fixed ladder safety; Fall protection systems; Swing protection; Scaffolding **- EXAM 1**
7	Boyi Hu	Chapter 11 Extra reading materials prepared by the instructor	
8	Boyi Hu	Extra reading materials prepared by the instructor	- Confined space
9	Boyi Hu	Chapter 5 Extra reading materials prepared by the instructor.	- OSHAct – General Duty Clause; Standards development; Variances; OSHA reporting; Inspections and citations; Examples; Enhanced Enforcement Policy; Appeals and contests; Employer/Employee rights; - Safety standards and codes – General Industry and subparts; Maritime and long shoring; Construction and subparts
11	Boyi Hu	Chapter 16 Extra reading materials prepared by the instructor.	- 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.
12	Boyi Hu	Extra reading materials prepared by the instructor	- Robotics Safety
13	Boyi Hu	Extra reading materials prepared by the instructor	

14	Boyi Hu	Extra reading materials prepared by the instructor	
15	Boyi Hu	Chapter 12 Extra reading materials prepared by the instructor.	**Final Presentation** and **Exam** 2-

Required Textbooks and Software

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

Recommended Materials

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

Semester safety 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 on different quantitative accident analysis methods will also be reviewed. You will give an in-person presentation at the end of the semester.

Attendance Policy, Class Expectations, and Make-Up Policy

This class is going to be held in person, unless the course instructor is out of town for scientific conferences and federal funded research projects. This is in line with a recent university policy that encourages in-person classes as we adjust to the new normal of COVID-19 becoming endemic in our community. The lectures are there for your benefit as apart from the lecture itself, you can ask questions about topics you are not certain of in class and get a quicker response than email or office hours. You will be responsible for everything covered in class. 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 (EIN4210)

Assignment	**Percentage of Final Grade**
HW assignments	20%
Exam 1	20%
Exam 2	20%
Semester Project (with the In Class Presentation)	30%
Attendance and Quizzes	10%
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

A grade of C is required to pass this class. A C- is NOT considered passing.

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

Online Course Recording

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.

Campus Resources:

- You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated.
- If you are sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus.
- If you are withheld from campus by the Department of Health through Screen, Test & Protect, you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.
- UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the UF Health Screen, Test & Protect website for more information.
- Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.

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 suppor*t*, 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