

**OAKLAND UNIVERSITY**  
**School of Health Sciences**  
**Environmental, Health, and Safety Program**

**Course Syllabus:**  
**EHS 4420 – Construction Safety – Winter 2018**

**Instructor and Class Meeting Information:**

Instructor: **Darryl C. Hill, Ph.D., CSP**  
Office Hours: Instructor will be available by e-office hours or appointment  
Phone: (513) 383-5360 (office); (414) 477-6924 (cell); (513) 684-8702 (cell)  
Email: [dhill@oakland.edu](mailto:dhill@oakland.edu)

Class Sessions: **Online, WebEx sessions are 6:30pm ET – until, various Fridays and 9:00-10:30am, various Saturdays** (1<sup>st</sup> WebEx – Sat., Jan. 6, 2018, 9:00am ET)

Class Location: NA

**Text:** Hill, Darryl (ed), *Construction Safety Management and Engineering*, 2<sup>nd</sup> ed., American Society of Safety Engineers, Des Plaines, IL, 2014.

**Optional:** U.S. Dept. of Labor, OSHA, 29 *CFR 1926, Construction Industry Regulations*, Mancomm (Mangan Communications) Davenport, IA.

**Catalog Description:**

A general introductory course in construction safety that attempts to address the many facets of creating an organizational setting where management and workers are educated and motivated to perform safe, productive construction work. The course is attended to provide a broad overview of the many elements to consider in executing small and large construction projects. The foundation of the course is to present proven safety management methods used by construction managers / contractors to run safe jobs and explore other strategies to create a world-class construction safety culture.

**Learning Objectives:**

See Attached

## **Learning Goals for Performance and Knowledge Base:**

1. Demonstrate a comprehensive understanding of construction safety and the emerging trends in the discipline
2. Explain the profit drain caused by the high exposure of worker injury and identify strategies to minimize this exposure
3. Demonstrate an understanding of the role and importance of CEO, project management, and supervisor safety accountability
4. Prepare a template for identifying construction safety process key components to support continuous improvement at a jobsite
5. Discuss and analyze strategies in the following construction areas: fall protection, steel erection, scaffolds, aerial lifts, cranes, excavation, and environmental

**Methods of Instruction, Course Requirements, & Performance Assessment:** The Elluminate sessions will constitute an overall synthesis of the text. Because of my desire to supplement the textbook material, the coverage in the class will by no means exactly follow the order of the material presented in the textbook. The WebEx sessions are intended to expand upon and/or illustrate basic points in the chapters.

- I. Exams – The two (2) exams are based upon WebEx sessions, textbook material, online activities, discussion forums and handouts. The midterm is **Feb. 16 (Moodle)**. The final examination is **April 13 (Moodle / Case Study)**. There are no make-up exams except for emergencies – i.e. family death, hospitalization w/note. Arrangements can be made to take exams prior to the scheduled class period, if there is an employer or personal conflict with either exam date.
- II. Group / Team Project – The semester project for the class will involve students teaming to develop a comprehensive construction project safety program. Teams are formed during the second-class session and size is based upon the number of students enrolled. Each team will have a separate and unique assignment based upon varying construction project parameters. Each team is provided their individual project assignment by Week 2 and discussed during Week 3 WebEx class session. All students are required to participate for the project presentation.

The oral project presentations and group written safety program are presented / submitted per the class schedule (page 3-5). The outline to follow for the oral presentation and written (group) report is distributed and discussed during the 2<sup>nd</sup> WebEx session. Points awarded for the group project is based upon the oral presentation and group project plan.

- III. Online Activities – An online activity will comprise of critical thinking questions or case studies based upon lectures, assigned reading, and guest lecturers. Each online activity is worth 10 pts. Assignments will not be accepted after the due date/time.
- IV. Quiz – Quiz will evaluate the student understanding for course objectives and student learning outcomes. There are no make-ups for a missed quiz.
- V. Discussion Forum - A discussion forum is application-based resulting from construction safety concepts, principles and key terms. The forums provide opportunity for problem solving and peer review and critique. Feedback is periodically provided by the instructor to allow further discussion and critical analysis. Each forum discussion is worth 5 pts.

**Course Evaluation:**

Quiz	10 pts.
Online Activities (2)	20 pts.
Discussion Forum (3)	15 pts.
Midterm Exam	15 pts.
Group Project	20 pts.
Final Examination	<u>20 pts.</u>
Total	100 pts.

Grading System: The OU EHS Program grading scale is adopted for the course.

**Class Schedule**

<u>Week</u>	<u>Discussion Topic / Assignment</u>
Jan. 6 (Sat.)	<p><b>WebEx Session #1 (recommended)</b> Introduction / Incident Causation, Chapter 2; Cost of Worker Injuries / Workers' Compensation, Chapters 3, 4</p> <ul style="list-style-type: none"> <li>• Construction Injury Facts</li> <li>• Principles of Variation</li> <li>• Common / Special Causes</li> <li>• Incident Causation Theories</li> <li>• Group Project</li> <li>• The Direct Cost Savings</li> <li>• The Benefits of Safe Jobs</li> <li>• Workers Compensation Insurance</li> </ul>

- Week 2      Online Activity #1
- Week 3      **WebEx Session #2** - Elements of an Effective Safety Program /  
Zero Accident Techniques / Scheduling, Chapters 9, 10, 11; Substance  
Abuse / Incentives / OSHA, 1926 Standards, Chapters 7, 8, 14
- Project Safety Program
  - Project and Task Planning
  - Accident / Incident Investigation
  - The Relationship between Scheduling and Safety
  - Short-Interval Schedules
  - Effect of Substance Abuse Programs on Safety Performance
  - What's Wrong (or Right) with Safety Incentives?
  - Inspections
  - OSHA State-Plans
  - Consultation Services
  - Drug Testing
- Week 4      Discussion Forum #1
- Week 5      **WebEx Session #3** - Human Factors in Construction Safety /  
Fall Protection, Chapter 15 Steel Erection, Chapter 16
- Effectiveness in Safety Management
  - Ergonomics
  - Fall Prevention / Protection
  - Guardrails, Handrails, and covers
  - Midterm Review
  - Structural steel assembly
  - Column anchorage
  - Beams and columns
- Week 6      Online Activity #2
- Week 7      **MIDTERM – Moodle**
- Week 8      **NO CLASS – Winter Recess**
- Week 9      **WebEx Session #4** - Rigging / Scaffolds / Safety & Health Team  
Building, Ladders / Electrical / Excavation / Demolition  
Chapters 17, 18, 19, 20, 21, 24
- Aerial Lifts
  - Cranes
  - Scaffolds
  - Ladders
  - Excavation, Trenching, and Shoring

- Arc Flash & NFPA 70E
- Demolition & Engineering Surveys

Week 10	<p><b>WebEx Session #5</b> - Occupational Health Risks in Construction / Environmental Issues Designing for Safety / Construction Contracts / Subcontractors Chapters, Safety and the Designer, Chapters 12, 13, 23</p> <ul style="list-style-type: none"> <li>• Musculoskeletal Disorders</li> <li>• Occupational Skin Diseases</li> <li>• Environmental Permits</li> <li>• Hazardous Materials</li> <li>• Permit Required Confined Spaces</li> <li>• Designer Liability</li> <li>• Multi-Employer Worksites</li> <li>• The Selection Process</li> <li>• Influence of General Contractors on Subcontractors</li> </ul>
Week 11	Discussion Forum #2
Week 12	Quiz
Week 13	Discussion Forum #3
Week 14	<b>WebEx Session #6 (mandatory) / Group Presentations</b>
Week 15	<p><b>WebEx Session #7 (mandatory) / Group Presentations / Written Safety Program Due</b></p> <ul style="list-style-type: none"> <li>• Final Review</li> </ul>
Week 16	<b>FINAL EXAMINATION</b>

## **EHS 4420, Construction Safety Learning Objectives**

- Describe in detail the Construction Safety Institute (CII) research specific to Zero Accident Techniques and its impact to construction safety excellence.
- Describe each accident causation theory and their validity based upon historical data.
- Explain the benefits of safe jobs as it relates to a company's profit margin.
- List and explain three basic objectives for general liability insurance as it relates to the construction industry.
- Describe how a construction firm might use information about total costs of construction workers' injuries.
- Discuss how a construction safety professional can use the EMR to gain support for their safety process.
- Explain advantages and disadvantages to a disciplinary action program.
- Explain why the behavior-based process has never been widely accepted in construction.
- Explain the relationship between scheduling and safety.
- List the human factors in construction safety.
- List and explain key elements of OSHA's Voluntary Protection Program and its impact to construction safety excellence.
- Describe how to develop a 100% Fall Protection Program.
- List examples of "Design in Safety" as it relates to Fall Protection.
- List and discuss fall protection systems that will promote a safe construction working environment.
- Discuss how a general contractor will address exposure to falls from elevation for a project with multiple contractors and an aggressive schedule.
- Evaluate one accident causation theory and its usefulness to support (or debunk) the premise, All Accidents are Preventable.
- Compose a Universal Accident Causation Model.
- Discuss the Safe2Work training / drug testing concept.
- Identify steps to develop a Substance Abuse Program at a union installation project.
- Explain the disadvantages of a safety incentive program.
- List alternatives to implementing a safety incentive program.
- Develop a comprehensive scaffolding & ladder safety program.
- Explain the importance of teamwork and value systems in construction.
- Discuss the relationship between quality and safety at a jobsite.
- Discuss the potential liability impact at a multi-employer construction site.
- Explain the influence a general contractor may have on subcontractors.
- Discuss the role of owners to construction safety.
- List the health consequences of working in construction.
- List five environmental issues in construction industry.
- Write a comprehensive safety program based upon the given criteria.