

**College of Business and Technology**  
**School of HRD and Technology**  
**Course Syllabus**

TECH 3348.040 & .041  
Dr. James F. Harbaugh – HPR 219  
Office Hours: M-W 11 AM – 2 PM  
T-R 9 AM – 12 PM

Construction Safety  
Spring 2009  
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903.566.7331

**I. Course Description:**

This course will examine the application of selected regulations contained in the in 29 CFR 1926, OSHA Standards for the Construction Industry and other standards of practice pertaining to workers and work engaged in “construction, alteration, abatement and repair” on the construction site.

Historically, federal and state OSHA inspections in the construction industry have focused on (a) projects involving a large number of contractors and subcontractors, (b) projects involving trenching and excavations, tunnels, and shafts, asbestos removal, and other high hazard operations, (c) employee complaints of alleged company violations of “imminent danger” working conditions, and (d) fatal accidents and catastrophe investigations. Course materials will include information for the development of a written comprehensive environmental health and safety program for construction safety. (80% Lecture/20% Lab).

**II. Textbook:**

29 CFR 1926 (2007). *Construction industry regulations*. Davenport, Iowa: MANCOMM.

**III. Course Objectives:**

- A. Be able to identify the purpose of construction safety standards.
- B. Develop a literacy and understanding of a construction hazard safety sequence.
- C. Recognize potential and actual construction site hazards.
- D. Develop solutions for site hazards that are based on state or federal compliance requirements.
- E. Compose a set of site safety plans for selected construction operations/hazards.

**IV. Statement of Learning Objectives:**

By the end of this course, students should be able to:

- A. Receive an OSHA 30-hour construction industry outreach training card.
- B. Identify and correct major construction site hazards as identified by OSHA.
- C. Train construction employees about the correct processes and procedures for initiating and completing hazardous construction operations.
- D. Train construction employees about minimizing & eliminating hazards within the construction work site environment.

**V. Course Competencies:**

- A. Computer-Based Skills – Each student will complete site safety plans for specific hazard areas using word processing package. The student will present a completed construction safety manual for the instructors review. Internet search skills are essential to obtain access to the applicable regulations and various assignments in this course.
- B. Communication Skills – The student will utilize written and oral skills in presenting the analysis of construction safety plans.
- C. Interpersonal Skills – This competency will be addressed in TECH 3348.
- D. Problem Solving (Critical Thinking) – The student will use conceptual thinking, quantitative statistical skills, gathering and analysis of data, and creativity and innovation in analyzing various scenarios discussed in class, as well as in analyzing safety plans.
- E. Ethical Issues in Decision Making and Behavior – Students will make decisions about at-risk behaviors exhibited by construction workers and determine solutions based on safety, environmental, and health compliance requirements.
- F. Personal Accountability for Achievement – Each student will follow the designated suspense dates and course assignments according to the schedule designated by the instructor.
- G. Competence in Technology Principles -
  - 1. By the study of construction safety students will develop a competent foundation in construction safety programs and their function on a construction work site.
  - 2. Students may have the opportunity to experience construction safety internships as a result of gaining and mastering the course materials.

**VI. Course Requirements:**

- A. Assignments
  - 1. four topic summaries
  - 2. read assigned materials
  - 3. class attendance (complete OSHA 30 hour Construction Card)
  - 4. take multiple quizzes
  - 5. two exams
  - 6. present a daily “tailgate” construction safety briefing
  - 7. develop and present one (1) construction safety plan to be collated into a construction safety manual.
- B. Class attendance and participation may require students enrolled at ITV sites to attend UTT campus on selected dates.
- C. Field trips, audiovisuals, and guest speakers will be supplemental to the course.
- D. Weighted Grade Distributions\*
  - 1. four topics summaries 10%
  - 2. mid-term exam 20%

- |    |                                       |     |
|----|---------------------------------------|-----|
| 3. | final exam                            | 20% |
| 4. | “tailgate” construction training      | 20% |
| 5. | individual construction safety plan   | 20% |
| 6. | receive OSHA 30 hr. construction card | 10% |

\*All course requirements are graded by percentage of completion and correctness as determined by the instructor.

E. Students are required to log on and use Blackboard Learning Management Software to access their electronic gradebook and related course materials.

F. Suspense Dates:

Class Start Date: Tue, Jan 13, 2009  
 Class End Date: Thu, May 7, 2009  
 Class Drop Date: W, Mar 25, 2009  
 Class Period: T & R, 12:30 PM – 1:45 PM

- |    |                                     |              |
|----|-------------------------------------|--------------|
| 1. | topic summary #1                    | Tue, Feb 3   |
| 2. | topic summary #2                    | Tue, Feb 24  |
| 3. | topic summary #3                    | Tue, Mar 24  |
| 4. | topic summary #4                    | Tue, Apr 14  |
| 5. | mid-term exam                       | Tue, Mar 3   |
| 6. | final exam                          | Thu, May 7   |
| 7. | “tail-gate” safety training         | as scheduled |
| 8. | individual construction safety plan | Thu, Apr 9   |
| 9. | OSHA 30 hour construction card      | Thu, Apr 30  |

G. Regular classroom attendance is expected to successfully complete this course. Any make up course work due to a student’s absence is considered on a case by case basis.

**VII. Course Discussion Outline:**

- |    |  |         |           |
|----|--|---------|-----------|
| A. | Introduction to Construction Safety  | Lecture | wk #1     |
| B. | Safety Theories and Concepts   | Lecture | wk #1     |
| C. | Workers’ Compensation  | Lecture | wk #1     |
| D. | OSHA Compliance<br>Introduction to OSHA (1.0 hr.)-4<br>*Construction Safety Programs (1.0 hr.)-4<br>OSHA Definitions: competent, authorized,<br>qualified & designated (1.0 hr.)-4<br>*Ergonomics in the Workplace (0.5) | PP/Text | wk #2     |
| E. | 29 CFR 1926 Subparts A through E<br>Fall Protection (1.0 hr.)-F4<br>*Noise & Hearing Exposures (0.5 hr.) 29 CFR 1910.95<br>Hazard Communication & Health Hazards (1.0 hr.)-4   | PP/Text | wk #3/4/5 |

Health Hazards in Construction (1.0 hr.)-M  
 Personal Protective and Lifesaving Equip. (2.0 hr.)-M  
 \*Process Safety Management (1.0 hr.)

F.	*29 CFR 1910.178 Powered Industrial Trucks (1.0 hr.) *29 CFR 1910.212 General Machine Guarding (1.0 hr.)	PP/Text PP/Text	wk #6 wk #6
G.	29 CFR 1926 Subparts F through J *Materials Handling, Storage, & Use (1.0 hr.) *Welding and Cutting Safety Practices (1.0 hr.) *Hand and Power Tool Safety Practices (1.0 hr.) *Fire Protection Strategies (1.0 hr.)	PP/Text	wk #7/8
H.	MIDTERM EXAM		wk #8
I.	29 CFR 1926 Subparts K through O Electrical Wiring Design & Protection (1.0 hr.)-F4 Overhead Power Lines, Elec. Tools, & Grounding 1.0 hr.) *Scaffolding Requirement Safety Practices (1.0 hr.) *Cranes, Derricks, Hoists, Elevators, & Conveyors (1.0 hr.)-F4 *Motor Vehicles and Mechanized Equipment (0.5 hr.)	PP/Text	wk #9/10
J.	29 CFR 1926 Subparts P through U *Concrete and Masonry Construction Safety (0.5 hr.) *Steel Erection Safety Practices (0.5 hr.) *Excavation & Trenching Safety Practices (1 hr.)-F4 *Confined Space Entry (1 hr.) *Underground Construction (1 hr.)	PP/Text	wk #11/12
K.	29 CFR 1926 Subparts V through Z *Motor Vehicle Rollover Protection (0.5 hr.) Stairway and Ladder Safety Practices (1 hr.) Overhead Power Lines, Elec. Tools, & Grounding (0.5 hr.)	PP/Text	wk #13
L.	Accident Investigation, Reporting, and Recordkeeping OSHA Record Keeping Requirements (0.5 hr.)	PP/Text, H/O	wk #14
M.	Emergency Response Plan Employee Emergency Action Plan (1.0 hr.)	PP/Text	wk #14
N.	*Signs, Signals, and Barricades Safety Practices (0.5 hr.)	PP/Text	wk #15
O.	Preventing Violence in the Workplace (0.5 hr.)	PP	wk #15
P.	Inspections, Citations, and Proposed Penalties (1.0 hr.)	PP/Text	wk #15
Q.	FINAL EXAM *Indicates additional elective topics used toward 30 hour OSHA card.		wk #16

## **VIII. IDEA Statement:**

If you have a disability, including a learning disability, for which you request an accommodation, please contact Ida MacDonald in the Disability Support Services office, so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Support Services counselor. For more information, call or visit the Student Services Center located in the University Center, Room 282. The telephone number is 903.566.7079 (TDD 565.5579).

## **IX. Interactive Television Class Statement:**

Both audio and video will be recorded during interactive television classes. The recorded class information will be made available to ITV students in case of ITV transmission problems.

## **X. Academic Honesty Statement:**

“Academic dishonesty, such as unauthorized collusion, plagiarism and cheating, as outlined in the Handbook of Operating Procedures, University of Texas at Tyler, will not be tolerated. University regulations require the instructor to report all suspect cases of academic dishonesty to the Dean of Students for disciplinary action. In the event disciplinary measures are imposed on the student, it becomes part of the student’s official school records.” Also, please note that the handbook obligates you to report all observed cases of academic dishonesty to the instructor.

## **XI. Grade Replacement:**

If you are repeating this course for a grade replacement, you must file intent to receive grade forgiveness with the Registrar by the 12<sup>th</sup> day of class. Failure to file intent to use grade forgiveness will result in both the original and repeated grade being used to calculate your overall grade point average. A student will receive grade forgiveness (grade replacement) for only three (undergraduate student) or two (graduate student) course repeats during his/her career at UT Tyler. (2006-2008 Catalogue, p. 35).

## **XII. University Policies Regarding Academic Processes:**

### **POLICIES THAT MUST APPEAR IN COURSE SYLLABUS**

The following University policies must appear on each course syllabus or be provided as an informational sheet (web-links to these policies may be used in the print or electronic syllabus)

<http://www.uttyler.edu/academicaffairs/syllabuspolicies.pdf>

#### **Students Rights and Responsibilities**

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <http://www.uttyler.edu/wellness/StudentRightsandResponsibilities.html>

#### **Grade Replacement/Forgiveness**

If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12<sup>th</sup> day of class. Failure to do so will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates will receive grade forgiveness

(grade replacement) for only three course repeats; graduates, for two course repeats during his/her career at UT Tyler.

#### **State-Mandated Course Drop Policy**

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped

after the 12<sup>th</sup> day of class (See Schedule of Classes for the specific date).

Exceptions to the 6-drop rule include, but are not limited to, the following: totally withdrawing from the university; being administratively dropped from a course; dropping a course for a personal emergency; dropping a course for documented change of work schedule; or dropping a course for active duty service with the U.S. armed forces or Texas National Guard.

Petitions for exemptions must be submitted to the Registrar's Office and must be accompanied by documentation of the extenuating circumstance. Please contact the Registrar's Office if you have any questions.

#### **Disability Services**

In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Support Services counselor. If you have a disability, including a learning disability, for which you request an accommodation, please contact Ida MacDonald in the Disability Support Services office in UC 282, or call (903) 566-7079.

#### **Student Absence due to Religious Observance**

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

#### **Student Absence for University-Sponsored Events and Activities**

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

#### **Social Security and FERPA Statement:**

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

### **XIII. Reference List:** (books)

29 CFR 1910. (2002). *OSHA general industry regulations*. Davenport, Iowa: MANCOMM Publications. ISBN: 0-9669664-8-1.

Goetsch, David L. (2003). *Construction Safety and Health*. Upper Saddle River, New Jersey: Pearson Prentice-Hall. ISBN 0-13-093215-9.

Herberle, Dave. (1998). *Construction safety manual*. New York: McGraw-Hill.

J.J. Keller. (2000). *Official OSHA construction safety handbook*. Fox River Valley, Wisconsin: Keller & Associates, Inc.

MacCollum, David V. (1995). *Construction safety planning*. New York: John Wiley & Sons.

Moran, Mark M. (1996). *Construction safety handbook*. Rockville, Maryland: Government Institutes, Inc.

(periodicals)

*Industrial Safety & Hygiene News*. Troy, Michigan: BNP Media. .

*Occupational Health and Safety*. Dallas, Texas: Stevens Publishing.

*Professional Safety, Journal of the American Society of Safety Engineers*. Des Plaines, Illinois: American Society of Safety Engineers.

*Public Works*. Washington, D.C.: Hanley Wood LLC.

*Safety & Health*. Itasca, Illinois: National Safety Council.

*Well Servicing*. Dallas, Texas. Workover/Well Servicing Publications.

(web sites)

[www.osha.gov](http://www.osha.gov)

[www.nist.gov](http://www.nist.gov)

[www.nashb.org](http://www.nashb.org)

[www.niosh.gov](http://www.niosh.gov)

[www.agc.org](http://www.agc.org)

#### **XIV. Topic Summaries:**

Write topics summaries from recent periodicals, not handbooks or textbooks. Each summary will be one page in length. Each summary must come from a different titled periodical or journal. The article you choose must have relevance to construction safety and reflect current trends in the area of construction worker health and safety. Topics listed below may be used for the four (4) required topic summaries. See topic summary example attached to the syllabus, course outline, and course calendar for suspense dates.

- a. personal protective and life safety equipment
- b. fire protection
- c. signs, signals, and barricades
- d. tools and welding equipment
- e. electrical power distribution
- f. scaffolds and ladders
- g. fall protection systems
- h. cranes, derricks, hoists, elevators, and conveyors
- i. excavations
- j. concrete and masonry operations
- k. steel erection
- l. demolition
- m. heavy construction equipment
- n. toxic and hazardous substances

## **XV. Construction Worker Health and Safety Program Project:**

Soon many safety supervisors will be faced with developing a comprehensive construction company safety program much like many safety supervisors must do in other business and industry settings. Your assignment will consist of:

- A. Research any existing comprehensive construction safety program as illustrated by those suggested program formats provided by WCI/TDI and OSHA.
- B. Determine applications to your construction company work environment setting.
- C. Develop program components that will make up a comprehensive construction safety program to include:
  - 1. policy and management statement
  - 2. construction site compliance requirements
  - 3. construction health & safety hazard identification procedures
  - 4. construction health & safety hazard problem solving process and employee involvement
  - 5. implementation process for solutions
  - 6. follow-up and monitoring processes
  - 7. construction health & safety training-prevention & control procedures
  - 8. use of consultants
  - 9. program document approval page

## **XVI. “Tailgate” Construction Safety Briefing:**

Each student will be required to develop and present a construction safety “tailgate” briefing to the class as if this were a daily process prior to construction work at any job site. Each student will be provided a construction safety topic to present using the following “tailgate” training format. The instructor will provide you with your training date.

- A. Introduction (focus)
- B. Objectives (why)
- C. Information (what is required)
- D. Quiz (understanding)

## **XVII. Reading List** (books)

29 CFR 1910. (2002). *OSHA general industry regulations*. Davenport, Iowa: MANCOMM Publications. ISBN: 0-966966 4-1.

Goetsch, David L. (2003). *Construction safety and health*. Upper Saddle River, New Jersey: Pearson Prentice-Hall. ISBN 0-13-093215-9.

Herberle, Dave. (1998). *Construction safety manual*. New York: McGraw-Hill.

J.J. Keller. (2000). *Official OSHA construction safety handbook*. Fox River Valley, Wisconsin: Keller & Associates, Inc.

MacCollum, David V. (1995). *Construction safety planning*. New York: John Wiley & Sons.

Moran, Mark M. (1996). *Construction safety handbook*. Rockville, Maryland: Government Institutes, Inc.

(periodicals)

*Industrial Safety & Hygiene News*. Troy, Michigan: BNP Media. .

*Occupational Health and Safety*. Dallas, Texas: Stevens Publishing.

*Professional Safety, Journal of the American Society of Safety Engineers*. Des Plaines, Illinois: American Society of Safety Engineers.

*Public Works*. Washington, D.C.: Hanley Wood LLC.

*Safety & Health*. Itasca, Illinois: National Safety Council.

*Well Servicing*. Dallas, Texas. Workover/Well Servicing Publications.

(web sites)

[www.osha.gov](http://www.osha.gov)

[www.nist.gov](http://www.nist.gov)

[www.nashb.org](http://www.nashb.org)

[www.niosh.gov](http://www.niosh.gov)

[www.agc.org](http://www.agc.org)

Vehicular Systems

McCosh, Dan. (1986). No-springs, no-shocks. *Popular science*. 444 (6), 60-63.

The author believes active suspension will replace springs and shocks with a computer and high-speed hydraulics. The primary benefit of the system is to isolate one suspension characteristic from another. Essentially, MacPherson struts are replaced with hydraulic struts which can react within 3/1000 second, and can cycle up to 1500 times/minute. A computer responds to tiny changes in body and wheel movement by controlling double-acting struts. As well as sensing bumps, the system reads the forces acting on the car body preventing it from banking to the outside of a curve. The idea of active suspension is credited to Britain's great interest in its application. American auto manufacturers have characterized the system as expensive, noisy, and consuming power, however, it may appear on some "expensive" U.S. automobiles.

*Reaction*

This article had good appeal for automobile enthusiasts who want to keep abreast of the latest technology. The reporting of this innovative suspension system was very consistent and well documented through interviews. Several pictures of the system components were shown as well as a pictorial schematic of the complete suspension system. Upon reading this article, anyone would have a good working knowledge of the computer controlled suspension.

Note: Margins are to be set at the following dimensions:

Left       = 1.25"  
Right      = 1.00"  
Top        = 1.00"  
Bottom     = 1.00"

