IE 558 Safety Engineering
Spring 2015: Wang Hall 2555; M, W, F 3:30-4:20pm (3 credits)
(syllabus & schedule updated Mon. Jan. 12, 2015)

Instructor: Vincent G. Duffy, Associate Professor, School of Industrial Engineering;
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Office: Wang Hall 4081; email: duffy@purdue.edu Phone: 765-496-6658. Office Hours: By appointment.

Course web site: available to students on Blackboard:
http://www.itap.purdue.edu/learning/tools/blackboard/

Learning Objective: To provide an understanding of the safety and health practices which fall within the responsibilities of the engineer and health sciences practitioner in the occupational environment.

Description: Application of human factors (ergonomics) and engineering practice in accident prevention and the reduction of health hazards in the occupational environment are presented. Special attention is devoted to the detection and correction of hazards and to contemporary laws and enforcement on occupational safety and health.

Topics Covered: Sustainability & Human-Centered Design; Product Safety & Liability; Hazard Assessment, Prevention & Control; Establishing a Safety-First Corporate Culture; Ethical Behavior in Organizations & Company's Role; Best Practices in Safety Management; Accidents & Their Effects; Injuries & Workers' Compensation; Theories of Accident Causation; Integrated Approaches to Safety & Health; Personal Monitoring for Radiation Hazards; Noise & Vibration Hazards; Fall Protection Standards; Safety Training & A Teamwork Approach to Promoting Safety; Historical Perspectives & Community Right-to-Know Act; Risk Reduction Strategies; Human Factors & Ergonomic Hazards; Economics of Ergonomics; Patient Safety & Human Aspects of Healthcare; Industrial Medicine & Robots; Nano-scale Materials, Industrial Hygiene & Confined Spaces; Chemical Burns; Green Chemistry & the EPA; Quality Management Related to Safety; OSHA Enhanced Enforcement Policies & European REACH Regulations for Toxic Chemicals; Comparing ISO Processes & Standards on Environment, Risk Management, Energy Management, Quality & Ergonomics.

Prerequisites: Graduate Standing, Senior in Engineering, or permission from instructor.

http://www.coursesmart.com/IR/1460805/9780133484236?_hdv=6.8 (other options for obtaining the book include rent or purchase through University Bookstore).

Supplementary reading list: will be will include papers from the journals, conferences and books related to safety engineering.

Grading: Exams: Midterm (40%) and Cumulative Final (40%) for off-campus students, Presentation (10%), Homework (3 for 10% total). Homework and presentation should be submitted through blackboard (assignments). Tentative Mid-term Exam Schedule: Wed.Apr.8 & Finals week. Class participation will count for 10% for on campus students. On campus students will have 40% weighting for the higher exam score and 30% for the lower score.
Please Note:

- For the Presentation/Project: Supplementary readings list of journal options with e-
journal subscriptions will be available during class in week 2. Student preferences will
be submitted, and considered and the supplementary reading list will be formed by
these selections. Students will have two weeks to complete their embedded audio
Powerpoint type presentation. Guidance will be provided based on a List of 10 Ways
to Evaluate New and Existing Research. Considering time available, and based on other
student preferences for papers as expressed in weeks 3, a subset of all presentations
will be selected and shown in class. A brief discussion will be held during each class.
Students should prepare their comments in advance, to the extent possible. Each
powerpoint presentation should be 5-6 minutes. These presentations should be
prepared individually.

- For participation scores, on-campus students will need to use an iClicker 2. We. plan
to initiate the use of those in week 2 of the semester. There will be a varying number
of questions in different class meetings. Each class meeting will have equal weighting
in final calculation. All students can miss up to two classes without a deduction to the
participation score. Students are still responsible for the lesson content, if they miss
class.

**Computer Requirements:** Minimum computer requirements, PowerPoint for class
presentation, embedded audio capabilities – including microphone. Homework assignments,
exam answers, class notes, and reference materials will be posted to the course web site.

**Additional notes:**

1. Late materials will have a deduction of 10 points per day up to a maximum of 40 points.

2. Grading will take into account +/- . For instance, overall course scores averaging 97+ will
receive A+. 94-96 will be guaranteed A. 90-93 will be guaranteed A-. 87-89 will be
guaranteed B+. will be guaranteed 84-86, B; will be guaranteed 80-83 B-; 77-79 will be
guaranteed C+; 74-77 C; 69-73 C-. Lower scores may receive D or F. Some cutoff points
may be lowered slightly to favor students in finalizing overall course grades.

3. In the event of a major campus emergency, course requirements, deadlines and grading
percentages are subject to changes that may be necessitated by a revised semester calendar
or other circumstances. If you can not access the course webpage on Blackboard, please send
a note to my email address: duffy@purdue.edu or call my office phone at (765) 496-6658.

4. Emergency procedures will be outlined in class and are included with this document on
subsequent page.
EMERGENCY PREPAREDNESS SYLLABUS ATTACHMENT

EMERGENCY NOTIFICATION PROCEDURES are based on a simple concept – if you hear a fire alarm inside, proceed outside. If you hear a siren outside, proceed inside.

- **Indoor Fire Alarms** mean to stop class or research and **immediately evacuate** the building.
  - Proceed to your Emergency Assembly Area away from building doors. **Remain outside** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.

- **All Hazards Outdoor Emergency Warning Sirens** mean to **immediately seek shelter** (Shelter in Place) in a safe location within the closest building.
  - "Shelter in place" means seeking immediate shelter inside a building or University residence. This course of action may need to be taken during a tornado, a civil disturbance including a shooting or release of hazardous materials in the outside air. Once safely inside, find out more details about the emergency*. **Remain in place** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.

*In both cases, you should seek additional clarifying information by all means possible...Purdue Emergency Status page, text message, email alert, TV, radio, etc...review the Purdue Emergency Warning Notification System multi-communication layers at [http://www.purdue.edu/ehps/emergency_preparedness/warning-system.html](http://www.purdue.edu/ehps/emergency_preparedness/warning-system.html)

EMERGENCY RESPONSE PROCEDURES:

- Review the Building Emergency Plan (available on the Emergency Preparedness website or from the building deputy) for:
  - evacuation routes, exit points, and emergency assembly area
  - when and how to evacuate the building.
  - shelter in place procedures and locations
  - additional building specific procedures and requirements.

EMERGENCY PREPAREDNESS AWARENESS VIDEOS

- "Shots Fired on Campus: When Lightning Strikes," is a 20-minute active shooter awareness video that illustrates what to look for and how to prepare and react to this type of incident. See: [http://www.purdue.edu/securePurdue/news/2010/emergency-preparedness-shots-fired-on-campus-video.cfm](http://www.purdue.edu/securePurdue/news/2010/emergency-preparedness-shots-fired-on-campus-video.cfm) (Link is also located on the EP website)

MORE INFORMATION
Reference the Emergency Preparedness web site for additional information: [https://www.purdue.edu/ehps/emergency_preparedness/](https://www.purdue.edu/ehps/emergency_preparedness/)