

Dr. David Fender

dfender@murraystate.edu

Office Phone: (270) 809-6651

Office: 157H IT

DEPARTMENT: Occupational Safety and Health

COURSE PREFIX: OSH

COURSE NUMBER: 452

CREDIT HOURS: 3.0

I. TITLE:

Systems Approach to Hazard Control

II. COURSE DESCRIPTION AND PREREQUISITE(S):

This course is designed to identify the broad spectrum of actual and potential hazards such as biological, mechanical, and human factors, involving product safety, system development, and the workplace and to apply a systems approach to their resolution. Includes such areas as product and preliminary hazard analysis, failure mode and effect analysis, and fault tree analysis.

Prerequisite(s): N/A

III. COURSE OBJECTIVES:

The student will be able to:

- A. Have an understanding of 29 CFR 1910.119, Process Safety Standard. (d, j, k)*
- B. Define and discuss key terms related to product safety, systems safety and hazard control. (d, k)*
- C. Have an understanding of the major phases of system safety. (d, g, j, k)*
- D. Provide various quantitative techniques to be used for system safety analysis. (a, b, c, d, k)*
- E. Use statistical methods in the development of a systems safety engineering program. (a, b, c, d, k)*
- F. Apply systems safety techniques on real-world examples. (a, b, c, d, g, j, k)*
- G. Understand key issues and concerns regarding product safety (c, d, j, k)*

*This course contributes to the educational objectives of our program through the following program outcomes:

- a. Ability to apply basic mathematical and scientific knowledge in the safety and health field.
- b. Ability to analyze and interpret data pertinent to the safety and health field, and to design and conduct experiments.
- c. Ability to anticipate, identify, & evaluate hazardous conditions and practices, & to identify and solve applied science problems.
- d. Ability to develop and implement hazard control methods, procedures, programs, and system designs.
- g. Ability to express thoughts effectively in oral and written communications.
- j. Knowledge of current safety and health issues.
- k. Ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice and to demonstrate mastery of the field of safety and health.

IV. CONTENT OUTLINE:

Unit 1	Pages (Roland & Moriarty)
Introduction (1)	1-20
Life Cycle (2)	21-28
Tasks (3)	29-34; 41-45
System Safety Program Plan (4)	35-40; 62-68
Risk Assessment (6-8)	45, 301-330
Human Factors (10)	53-59
Exam 1	
Unit 2	Pages
Product Liability (5)	----
Malfunctions (9)	----
Introduction Hazard Analysis (11)	193-205; 88-90
Preliminary Hazard List (25)	----
Preliminary Hazard Analysis (14)	206-212
Fault Hazard Analysis (12)	223-225
O&SHA (13)	213-222;

FMEA (26)	226-228
Health Hazard Analysis (27)	----

Exam 2

<u>Unit 3</u>	<u>Pages</u>
Probability (15)	103-112
Network Theory (16)	165-173
Cut Sets (18)	183-190
Fault Tree Analysis (19-22)	229-260
Safety Through Design (28)	----
Process Safety Standard (23)	----

Final Exam

V. INSTRUCTIONAL ACTIVITIES:

Lecture, student discussion and small group problem solving applying techniques learned in class.

VI. FIELD, CLINICAL, AND/OR LABORATORY EXPERIENCES: N/A

VII. TEXT(S) AND RESOURCES:

Reference Text (not required): System Safety Engineering and Management, by Roland & Moriarty Library.

Materials presented in class.

Professional journals and related literature.

Web site: <http://campus.murraystate.edu/academic/faculty/dfender/>

Presentation outlines, suitable for note taking, are available on the web site.

VIII. EVALUATION AND GRADING PROCEDURES:

Each exam is worth 100 points and there are two 50 point group project grades. Attendance is worth 45 points (10%), and total possible is 445 points. Make-up exams will be allowed only for excused absences as determined by the instructor.

Scale: A=90-100%; B=80-89%; C=70-79%; D=60-69%; F=59% & below.

IX. ATTENDANCE POLICY:

Students are expected to adhere to the MSU Attendance Policy outlined in the current MSU Bulletins.

Students are expected to attend class regularly. An excused absence, except in extraordinary circumstances, will only be given if coordination is made prior to the absence. No make-up work will be allowed for unexcused absences. If a student arrives after attendance is taken, it is up to the student to contact the instructor immediately after class to have the attendance record corrected, otherwise record will stand as originally noted. Attendance points incorporated in grading will be given based upon the instructor's judgment and points will start being deducted when there are more than three absences. For excessive absences (8 or more) final letter grade will be lowered. Refer to the attendance policy in the MSU Undergraduate/Graduate Bulletin.

X. ACADEMIC HONESTY POLICY:

University Policy:

Murray State University takes seriously its moral and educational obligation to maintain high standards of academic honesty and ethical behavior. Instructors are expected to evaluate students' academic achievements accurately, as well as ascertain that work submitted by students is authentic and the result of their own efforts, and consistent with established academic standards. Students are obligated to respect and abide by the basic standards of personal and professional integrity.

Violations of Academic Honesty include:

Cheating - Intentionally using or attempting to use unauthorized information such as books, notes, study aids, or other electronic, online, or digital devices in any academic exercise; as well as unauthorized communication of information by any means to or from others during any academic exercise.

Fabrication and Falsification - Intentional alteration or invention of any information or citation in an academic exercise. Falsification involves changing information whereas fabrication involves inventing or counterfeiting information.

Multiple Submission - The submission of substantial portions of the same academic work, including oral reports, for credit more than once without authorization from the instructor.

Plagiarism - Intentionally or knowingly representing the words, ideas, creative work, or data of someone else as one's own in any academic exercise, without due and proper acknowledgement.

Instructors should outline their expectations that may go beyond the scope of this policy at the beginning of each course and identify such expectations and restrictions in the course syllabus. When an instructor receives evidence, either directly or indirectly, of academic dishonesty, he or she should investigate the instance. The faculty member should then take appropriate disciplinary action.

Disciplinary action may include, but is not limited to the following:

- 1) Requiring the student(s) to repeat the exercise or do additional related exercise(s).
- 2) Lowering the grade or failing the student(s) on the particular exercise(s) involved.
- 3) Lowering the grade or failing the student(s) in the course.

If the disciplinary action results in the awarding of a grade of E in the course, the student(s) may not drop the course.

Faculty reserve the right to invalidate any exercise or other evaluative measures if substantial evidence exists that the integrity of the exercise has been compromised. Faculty also reserve the right to document in the course syllabi further academic honesty policy elements related to the individual disciplines.

A student may appeal the decision of the faculty member with the department chair in writing within five working days. Note: If, at any point in this process, the student alleges that actions have taken place that may be in violation of the Murray State University Non-Discrimination Statement, this process must be suspended and the matter be directed to the Office of Equal Opportunity. Any appeal will be forwarded to the appropriate university committee as determined by the Provost.

Instructor Policy:

In addition to the above, cheating, plagiarism or doing work for another person that will receive academic credit are all impermissible. This includes the use of unauthorized books, notebooks, or other sources in order to secure or give help during an examination, the unauthorized copying of examinations, assignments, reports, or term papers, or the presentation of unacknowledged material as if it were the student's own work. Any violations will receive, at a minimum, a grade of zero.

XI. NON-DISCRIMINATION POLICY STATEMENT:

Murray State University endorses the intent of all federal and state laws created to prohibit discrimination. Murray State University does not discriminate on the basis of race, color, national origin, gender, sexual orientation, religion, age, veteran status, or disability in employment, admissions, or the provision of services and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities equal access to participate in all programs and activities. For more information, contact the Director of Equal Opportunity, 103 Wells Hall. 270-809-3155 (voice), 270-809-3361 (TDD).

XII. OTHER INFORMATION:

PERSONAL ELECTRONICS USAGE POLICY:

No usage of cell phones, PDAs, pagers, blackberries and similar devices shall be allowed during class without the prior consent of the instructor. This includes incoming and outgoing calls of any type, email, text messaging and use of cell phone calculators on tests and quizzes. Cell phones must be kept turned off and out of sight (i.e. in a purse or bag or secured to a person's belt).

Permission to have a phone on in case of an emergency or critical family situation may be obtained from the instructor before class. Should a cell phone ring during class the student may be asked to leave class for that day. Laptop computers may be used to take notes but will not be used for any other purpose.

Statement of Policy:

The instructor reserves the right to make changes in the organization, content, and requirements of the course.