



Marshall University
College of Information Technology & Engineering
Safety Technology Department

Spring 2008

HUMAN FACTORS IN ACCIDENT PREVENTION
SFT 660

LOCATION: Smith Hall, Room 334, Huntington Campus

TIME: Thursdays, 4:00pm-6:20pm

INSTRUCTOR: J. Patrick Conlon, CSP
Safety Technology Department
Communications Bldg., Room 212-I
Huntington Campus
Office Phone – 304.696.3067
Department Fax – 304.696.3070
Email – conlonj@marshall.edu

OFFICE HOURS: Mondays – 4:00pm-6:00pm
Tuesdays – 1:00pm to 4:00pm
Wednesdays – 1:00pm to 4:00pm
Thursday – 1:00pm to 4:00pm
Other times by appointment

DESCRIPTION: This 3 credit course introduces students to human factors engineering concepts and their application to human-machine system design and interaction. Students will explore the principles of human factors and their relationship to accident causation and prevention focusing on the development of safe user-friendly systems. The course addresses design and evaluation methods, human cognitive and physical capabilities and limitations, biomechanics and work physiology, engineering anthropometry, work space design, and production automation.
Prerequisites – None

TEXTBOOK: *An Introduction to Human Factors Engineering*
Wickens, C. D., Lee, J. D., Liu, Y., and Gordan Becker, S. E.
2nd Edition, Pearson Prentice Hall, 2004, ISBN:0-13-183736-2

- OUTCOMES:** Successful completion of the course will enable the student to:
- Describe the basic principles of human factors engineering including human-machine interaction and human information processing;
 - Evaluate human sensory, cognitive, and physical capabilities and limitations relevant to the design of human-machine systems;
 - Identify and use human factors engineering resources and research techniques for workstation design or evaluation;
 - Develop effective recommendations to correct human factors deficiencies in existing human-machine systems.

- ACTIVITIES:** Course activities will include:
- Lectures & PowerPoint Presentations
 - Case Studies and Multimedia Presentations
 - Research Project – Individual Writing Exercise
 - PowerPoint Presentation – Individual Public Speaking Exercise

TECHNICAL

REQUIREMENTS: Ability to use basic computer software for Internet research, word processing, graphic presentation, and a calculator for mathematical problem solving.

EVALUATION: Exams/100 points each – two per semester, each will include a combination of multiple choice, true/false, fill in the blank, and essay questions based on the textbook assignments and classroom activities.

Class Participation/100 points – complete in-class projects, both individual and in groups, including reading assignments, writing assignments, discussions, mathematical problem sets, quizzes, case studies, etc.

Research project/200 points – prepare a technical paper investigating current applications of human factors engineering in accident prevention within industries such as: aerospace, information technology, petrochemical, transportation, power generation, military, etc. The project will require detailed Internet and library research of the selected topic. Papers will be twelve pages in length (including cover page and bibliography), Times New Roman 12 font, one-inch margins, double spaced, and include a minimum of ten different referenced sources. Final paper must be submitted electronically in Microsoft Word format. Prepare a ten minute PowerPoint presentation based on the student’s research project and deliver to the class.

Class Attendance/100 points – students are expected to attend all scheduled classes. Excused absences will not result in loss of points; see additional notice concerning attendance below. [1st absence = -5 points, 2nd absence = -5 points, 3rd absence = -10 points, and each subsequent absence = -10 points]

Total Possible Points = 600

Note: Late completion of exams must be approved in advance by the instructor.

GRADING:

Grades will be awarded according to the following scale:

- 90% - 100% = A
- 80% - 89% = B
- 70% - 79% = C
- 60% - 69% = D
- 59% or lower = F

**SCHEDULE OF ASSIGNMENTS
& ACTIVITIES:**

1. 1/17/08:
Student Data Sheets, Introductions, Course Overview/Syllabus
Review: Chapter 1 – Introduction to Human Factors Engineering
Out of class activities: Chapters 1, 2 & 3
2. 1/24/08:
Review: Chapter 2 – Research Methods
Chapter 3 – Design and Evaluation Methods
Multimedia: Ergonomic Safety (30 minutes)
FAA WebTraining: Module 1 – Introduction
Out of class activities: Chapter 4
3. 1/31/08:
Review: Chapter 4 – Visual Sensory Systems
Multimedia: Nuclear Power (30 minutes)
FAA WebTraining: Module 2 – Human Factors Model
Out of class activities: Chapter 5
4. 2/7/08:
Review: Chapter 5 – Auditory, Tactile, And Vestibular Systems
Multimedia: Meltdown at Three Mile Island (60 minutes)
FAA WebTraining: Module 3 – Usability
Out of class activities: Chapter 6
5. 2/14/08:
Review: Chapter 6 - Cognition
Multimedia: Blackout (30 minutes)
FAA WebTraining: Module 4 – Visual Displays
Due Date: Research Project Outline
Out of class activities: Chapter 7
6. 2/21/08:
Review: Chapter 7 – Decision Making
Case Study 1: Election 2000 – Voting Machine Design
FAA WebTraining: Module 5 – Non-Visual Displays
Out of class activities: Chapter 8

7. 2/28/08:
 - Review: Chapter 8 – Displays
 - Multimedia: Washing Machine Design and Manufacture (20 minutes)
 - FAA WebTraining: Module 6 – Controls
 - Out of class activities: Chapter 9

8. 3/6/08:
 - Review: Chapter 9 - Control
 - Case Study 2: Hospital Ergonomics Survey
 - FAA WebTraining: Module 7 – Environment
 - Out of class activities: Prepare for exam 1 (Chapters 1, 2, 3, 4, 5, 6, 7, 8, & 9)

9. 3/13/08:
 - Exam 1: Chapters 1, 2, 3, 4, 5, 6, 7, 8, & 9
 - Multimedia: New Opportunities . . . Challenges for Human Factors in the Globalization of Safety, Health, and the Environment (80 minutes)
 - Out of class activities: Chapter 10

10. 3/20/08:
 - Review: Exam 1
 - Chapter 10 – Engineering Anthropometry and Workspace Design
 - Case Study 3: Designing the Touch-Tone Phone
 - FAA WebTraining: Module 8 – Cognition
 - Out of class activities: Chapters 11 and 12

11. 3/27/08:
 - SPRING BREAK – No Class

12. 4/3/08:
 - Review: Chapter 11 – Biomechanics of Work
 - Chapter 12 – Work Physiology
 - Multimedia: Crash of Flight 90 (50 minutes)
 - FAA WebTraining: Module 9 – Team Performance
 - Due Date: Research Project Draft
 - Out of class activities: Chapters 13 and 14

13. 4/10/08:
 - Review: Chapter 13 – Stress and Workload
 - Chapter 14 – Safety, Accidents, and Human Error
 - Research Project Drafts
 - Multimedia: Working With Stress & Violence On The Job
 - Out of class activities: Chapter 16

14. 4/17/08:
 - Review: Chapter 16 – Automation
 - Research Project PowerPoints
 - Multimedia: Manufacturing Processes – Industrial Robotics
 - Out of class activities: Chapter 17, Research Project Paper

15. 4/24/08:

Review: Chapter 17 – Transportation Human Factors
Case Study 4: Human Errors – Medical Errors – Fatal Errors
Due Date: Research Project Paper
Out of class activities: Research Project PowerPoint

16. 5/1/08:

Presentations: Research Project PowerPoints
Out of class activities: Prepare for exam 2
(Chapters 10, 11, 12, 13, 14, 16, & 17)

17. 5/8/08:

Exam 2: Chapters 10, 11, 12, 13, 14, 16, & 17

**ADDITIONAL
NOTICES:**

Plagiarism/Academic Honesty/Academic Integrity – cheating, fabrication/falsification, plagiarism, etc., shall be subject to University policy as described in the current Undergraduate and Graduate catalogs.

Student Disabilities – students entitled to academic accommodations during the course are encouraged to contact Disabled Student Services (304.696.2288/Prichard Hall Room 117) as soon as possible to ensure that reasonable accommodations can be provided.

Academic Support Services – students interested in academic support services (advising, tutoring, and writing) are encouraged to contact the University College's Academic Advising Center for free programs and services to help them succeed in college courses (located in the Community and Technical College Building, lower level, 304-696-3169).

Weather-Related and/or Emergency Closings and Delays – students must adhere to the University policies for these events/conditions. Please contact the instructor by phone prior to class if you will miss class due to your local weather conditions if the University is still open. For information concerning the University status during inclement weather or emergencies will be available on local radio and television channels or call (304) 696-3170 or (304) 696-HELP.

Attendance – students are expected to attend all scheduled classes following the University policy for excused absence and weather related class cancellation as applicable. Students should notify the instructor of an absence prior to the class by voice mail or email. In the event of an excused absence class work can be made up within one week with scheduling and approval of the instructor.

