Ergonomics and Human Factors in Safety (OSHT 2305)

Credit: 3 semester credit hours (3 hour lecture)

Prerequisite: Passed the writing portion of TSI or other accepted testing instrument.

Course Description

The relationship of human behavior and ergonomics as applied to workplace safety.

Required Textbook and Materials

1. *ERGONOMICS: Foundational Principles, Applications, and Technologies*
   Author: Pamela McCauley Bush, PhD, CPE. CRC Press.
   a. ISBN: 978-1-4398-0445-2
2. One, 2 – 3 inch 3 ring binder with pockets
   a. Notebook paper for binder
   b. *Organization of notebook; contents should include:
      - Cover page with first and last name
      - Title of course
      - Day and time of weekly class meeting
      - Semester (example, "Spring 2019")
      - Dividers labeled: syllabus, PPT. lectures, study questions, handouts, exams
      - Calculator: TI-30XA. *Other electronic media may not be used during an exam as your calculator.
3. USB Flashdrive

Course Objectives

Upon completion of the course the student will be able to:

1. Explain the psychology of human behavior as it relates to workplace safety.
2. Identify ergonomic hazards; recommend appropriate controls.
3. Relate the human and workplace factors which contribute to ergonomic hazards.

Course Outline

A. Welcome to LIT:
   1. Introduction of faculty and students
   2. Expectations
   3. Policies
   4. Report Guidelines
B. Ergonomics Introduction
   1. What is Ergonomics?
   2. Human Factors and Ergonomics
   3. Application of Ergonomics
   4. Brief History of Ergonomics

5. Effectiveness and Cost-Effectiveness of Ergonomics

C. Systems of the Human Body
   1. Anatomy of Spine and Pelvis Related to Posture
   2. Biomechanics
   3. Muscular System
   4. Ergonomics and the Musculoskeletal System
   5. Costs of Back Injuries

D. Muscular Work and Nervous control of Movements
   1. Types of Muscular Work
   2. Muscular Fatigue
   3. Types of Muscle Contractions
   4. Measurement of Muscular Strength

E. Anthropometry
   1. What is Anthropometry?
   2. Terminology
   3. Myth of the Average Human
   4. Principles of Universal Design
   5. Anthropometric Measurements

F. Design of Workplaces and Hand Tools
   1. Work Design Analysis
   2. Designing for Hand Use
   3. General Guidelines for Workplaces with Controls & Displays

G. Work-Related Musculoskeletal Disorders
   1. Types of Work-Related MSD's
   2. Task-related Factors
   3. Personal Risk Factors
   4. Impact on Industry
   5. Ergonomic Program for WMSD

H. Heavy Work and Evaluating Physical Workloads and Lifting
   1. Heavy Work
   2. Manual Material Handling and Lifting
   3. Classification and Risks
   4. NIOSH Lifting Guideline
   5. Job Demands and Workplace Stress
   6. Mental Fatigue/Shiftwork Fatigue

I. Information Ergonomics, Controls, and Displays
   1. Mental Workload Measurement
   2. Primary and Secondary Task Performance
   3. Controls and Displays (Types)
   4. Control Layout and Design

J. Design and Assessment in Hot and Cold Workplaces
   1. Measuring the Thermal Environment
   2. Work in Hot Climates
   3. Work in Cold Climates

4. Protection Against Extreme Climates
5. Comfort and the Indoor Climate
6. Essays and Exercises

K. Warning Labels, Instructions, and Product Liability
1. Impact of Product Liability on Ergonomics and Human Factors in Product Design
2. Product Liability
3. Cognitive Systems

L. How to Implement An Ergonomic Program
1. Management and Employee Involvement
2. Setting Up the Ergonomics Program
3. Problem Identification
4. Hazard Prevention and Control
5. Training

Grading Scale

A = 90-100
B = 80-89
C = 70-79
D = 60-69
F = 59-0
*Notebooks will be graded the evening of the final.

Course Evaluation

Final grades will be calculated according to the following criteria:

Test 1	15%
Test 2	15%
Test 3	15%
Report	15%
Notebook	10%
Final	30%

Course Policies

1. No food, drinks, or use of tobacco products in class.
2. Computers, telephones, headphones, and any other electronic devices must be turned off while in class or used only with permission of the instructor.
3. Do not bring children to class.
4. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an 'F' in the course.
5. Additional class policies as defined by the individual course instructor are in the addendum

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination status that provides comprehensive civil rights for persons with disabilities. Among other things, these statues require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator, at (409) 880-1737 or visit her office located in the Cecil Beeson Building, room 116B.

**Students with special needs and/or medical emergencies or situations should communicate with their instructor regarding individual exceptions/provisions. It is the student's responsibility to communicate such needs to the instructor.

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document change.