

## **Ergonomics and Human Factors in Safety (OSHT 2305)**



**Credit:** 3 semester credit hours (3 hour lecture)

**Prerequisite:** Passed the writing portion of COMPASS or other accepted testing instrument, CNBT 2342.

### **Course Description**

A study of the relationship of human behavior and ergonomics as applied to workplace safety.

### **End of Course Outcomes**

Explain the psychology of human behavior as it relates to workplace safety; identify ergonomic hazards; recommend appropriate controls, and relate the human and workplace factors which contribute to ergonomic hazards.

### **Required Textbook and Materials**

1. ERGONOMICS, Foundational Principles, Applications, and Technologies.  
Pamela McCauley Bush. CRC Press-Taylor & Francis Group
  - a. ISBN: 978-1-4398-0445-2
2. One, 11/2 – 2 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 2013”)
    - Dividers labeled: syllabus, PPT. lectures, study questions, handouts, exams

### **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

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### **Course Syllabus**

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
  6. End of chapter exercises
- 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
  6. End of chapter exercises
- 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
  5. End of chapter exercises
- E. Anthropometry
1. What is Anthropometry?
  2. Terminology
  3. Myth of the Average Human
  4. Principles of Universal Design
  5. Anthropometric Measurements
  6. End of chapter exercises
- F. Design of Workplaces and Hand Tools
1. Work Design Analysis
  2. Designing for Hand Use
  3. Types of Injuries and Disorders
  4. End of chapter exercises
- 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's
  6. End of chapter exercises
- H. Heavy Work and Evaluating Physical Workloads and Lifting
1. Heavy Work
  2. Manual Material Handling & Lifting
  3. Classification and Risks
  4. NIOSH Lifting Guidelines
  5. Job Demands and Workplace Stress
  6. Mental Fatigue/Shiftwork Fatigue

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### Course Syllabus

7. End of chapter exercises
- 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
  5. End of chapter exercises
- J. 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 = Less than 60

### 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%	*Notebooks will be graded the night of the final.
Final	30%	

### Course Requirements

1. Students are required to participate in labs. You cannot make up a lab assignment or activity.
2. Written Report.

### Course Policies

1. No food, drinks, or use of tobacco products in class.
2. Beepers, telephones, headphones, and any other electronic devices must be turned off while in class.
3. Do not bring children to class.
4. No late assignments will be accepted.
5. All exams are worth *at least* 100 and possibly more points. ***There are no makeup tests.***

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### **Course Syllabus**

6. Attendance. Perfect attendance means not missing any classes or any portion of a class. This includes not having any tardies or leaving class early. \*Four tardies equals one absence.

### **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 statutes 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.

### **Course Schedule**

Week 1	Course Introduction and Policies
Week 2	Chapter 1: Foundational Ergonomics
Week 3	Chapter 2: Systems of the Body, pages 37-47 Chapter 4: Muscular Work and Nervous Control of Movements, pages 106-112
Week 4	Chapter 5: Anthropometry
Week 5	Exam I
Week 6	Chapter 6: Design of Workplaces and Hand Tools
Week 7	Chapter 7: Work-Related WMSD's
Week 8	Chapter 8: (Part 1) Heavy Work & Evaluating Physical Workloads and Lifting Pages 241-255
Week 9	Spring Break: March 11-15
Week 10	Exam II
Week 11	Chapter 8: (Part 2) Pages 260-266 and NIOSH Lifting Equation
Week 12	Chapter 8: (Part 3) Pages 267-275 Job Demands: Workplace Stress and Fatigue
Week 13	Exam III
Week 14	Chapter 9: Information Ergonomics, Controls, and Displays
Week 15	How to Implement an Ergonomics Program
Week 16	FINAL

\*Where chapters are indicated the entire chapter is to be read, therefore, no page numbers are provided.

\*\*The order in which topics are covered is subject to change. Tests dates are also subject to change.

### **Contact Information:**

Instructor:	Joy Griffin
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Telephone:	(409)880-8850
Office Hours:	MTWR 12:00 – 4:00

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Course Syllabus