

EHS 218
OCCUPATIONAL ERGONOMICS

COURSE DESCRIPTION:

Prerequisites: None
Corequisites: None

This course emphasizes recognition of musculoskeletal disorders in institutional, office, and industrial settings. Topics include anthropometry, working postures, task analysis, manual materials handling, lifting equations, and environmental factors. Upon completion, students should be able to recognize ergonomic problems and recommend appropriate control measures. Course Hours Per Week: Class 3. Semester Hours Credit, 3.

LEARNING OUTCOMES:

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

- a. Identify signs and symptoms of ergonomic ailments.
- b. Identify industries and processes at high risk for cumulative trauma disorders.
- c. Conduct ergonomic analyses of work place tasks.
- d. Apply principles of universal and ergonomic design at a basic level.
- e. Implement administrative and engineering controls for ergonomic problems.
- f. Identify ergonomic stresses associated with video display terminals.
- g. Use anthropometric tables to understand design parameters.
- h. Apply the NIOSH lifting equation.
- i. Identify and apply applicable ergonomic standards at a basic level.

OUTLINE OF INSTRUCTION:

- I. Ergonomic ailments and their causes
 - A. Anatomy basics
 - B. Cumulative trauma disorders
 - C. Hand-arm vibration syndrome
 - D. Other human factor problems
 - E. At-risk industries
 - F. At-risk processes

- II. Identification and control of ergonomic stresses
 - A. Injuries and other indicators of ergonomic problems
 - B. Biomechanics
 - C. Major risk factors: repetition, force, position
 - D. Other factors: vibration, cold, sharp edges, production pressure, environment
 - E. Ergonomically neutral positions
 - F. Ergonomic task analysis
 - G. Control of ergonomic stresses: administrative, engineering, personal protection
 - H. Tool and task design

EHS 218

- III. Cognitive ergonomics and universal design
 - A. Cognitive errors
 - B. Design techniques for error reduction: standardization, stereotypes, redundancy, feedback
 - C. Universal design
- IV. Anthropometry
 - A. Statistical measures
 - B. Anthropometry tables
 - C. Application
- V. Displays, controls, and video display terminals (VDT's)
 - A. Displays and controls
 - B. Anthropometric issues
 - C. Cumulative trauma disorders and VDT's
 - D. Eyestrain
 - E. Psychological stress and production issues
 - F. Controls for VDT-related stresses
- VI. Quantitative methods and materials handling
 - A. Scope of injuries due to manual materials handling
 - B. Risk factors for back injuries due to lifting
 - C. Evaluation of lifting risks: NIOSH equation, lifting tables
 - D. Redesigning lifting tasks
 - E. Lifting techniques, training, and aids
- VII. Ergonomics programs and standards
 - A. Ergonomics programs: hazard evaluation and implementation
 - B. OSHA's (voided) ergonomics standard
 - C. Other standards

REQUIRED TEXTBOOK AND MATERIALS:

MacLeod, Dan (2000). *The Rules of Work*. Boca Raton, Florida: CRC Press.

STATEMENT FOR STUDENTS WITH DISABILITIES:

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 686-3652 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1309.