

**OSHE 242: Ergonomics  
Spring Semester, 2017**

**Syllabus**

**Instructor:** Lu Yuan, Sc.D., CSP  
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**Office Hrs:** Monday and Wednesday, 3:30 pm to 5:00 pm. Other times by special appointment.

**Course Description:**

Credit 3 hours. *Prerequisites: Enrollment in or prior credit for Mathematics 241 and OSHE 141.* This course explores ergonomic design principles which involve the planning and adapting of equipment and tasks to promote workers' efficiency and comfort. Major topics include: human anatomy, physiology, anthropometry, and other characteristics; and the application of ergonomic principles to workstations, tool design, and material handling procedures.

**Course Objectives:**

At the conclusion of this course, students will be able to:

1. Select different conceptual frameworks and models to summarize the diversity of ergonomics subjects.
2. Relate the human musculoskeletal system with the work that human performs.
3. Describe the importance of anthropometric information and apply it to the design of workstation, equipment, and tool.
4. Compare and assess the differences between standing and sitting postures and their importance in proper workstation design.
5. Predict how body tissues respond to excessive loading and apply the basic principles for the design of hand tools and equipment.
6. Explain the biomechanics of shoulder and back injuries.
7. Summarize ergonomic risk factors for musculoskeletal disorders and recommend interventions to the redesign of work.

**Course Text:**

Kroemer, K., Kroemer, H., and Kroemer-Elbert, K. (2001) *Ergonomics: How to Design for Ease and Efficiency, 2<sup>nd</sup> Edition*. Prentice Hall, Upper Saddle River, New Jersey.

**Exams:**

There will be one mid-term exam plus a final exam given during the semester to measure your progress. Both two exams will consist of fill-in-the-blank, short essay and math problems. The mid-term exam will cover the material studied up to that point. The final exam will be comprehensive, covering the entire course.

You will be permitted to make-up an exam ONLY if you have made arrangements PRIOR to the time the exam was originally administered. No make-up exam will be allowed if you merely have not shown up for the original exam and have not made arrangements to take a make-up. The make-up exam must be taken BEFORE the next scheduled class period.

**NO EXCEPTIONS will be allowed.**

**Homework:**

There are three sets of homework scheduled for this class. Homework will be collected at the beginning of the class in which they are due. They should be written clearly and logically. The calculation steps shall be included as appropriate. **Homework turned in after the due day will receive only partial credit.**

**Quizzes, Exercises, and Assignments (QEAs):**

To make the class more fun and interactive, six QEAs will be “randomly” given during the semester. They may appear at the beginning of the class, or at the end of the class, or be due by the specified class. Each QEA is worth 10 points. The highest five scores will be counted toward the grade total and the lowest one will be considered bonus points.

**Project:**

There will be a group research project which will require you to apply the principles learned in class to conduct an ergonomic job analysis in a real-life situation. The project will be reported both in 1) a paper of 5 to 10 pages, and 2) an oral presentation in 10 to 15 minutes. The project will be graded upon: 1) accuracy of analysis of the problem, 2) appropriateness of the corrective measures that are recommended, and 3) dissemination of information through oral presentation. Good grammar and correct spelling will also be considered in grading the paper.

You should PROVIDE ME WITH A COPY OF YOUR PAPER AND PRESENTATION SLIDES (IF THERE IS ANY) THAT I CAN KEEP. I will provide you with a summary of how the grade for your project was determined. Projects are due by the oral presentation dates on **MAY 1<sup>ST</sup>** and **MAY 3<sup>RD</sup>**. **Projects turned in after that date will receive only partial credit.**

**Course Grades:**

1. Grades will be assigned in accordance with the Departmental Scale:

<u>Points</u>	<u>(Percent)</u>	<u>Grade</u>
461-500	(93 - 100)	= A, Superior
421-460	(85 - 92)	= B, Very Good
381-420	(77 - 84)	= C, Average
341-380	(69 - 76)	= D, Below Average
0-340	(0 - 68)	= F, Fail

2. Basis for assigning grades:

Two Exams @ 100 points	=	200 points	(40% of grade)
Three Homework @ 50 points	=	150 points	(30% of grade)
Five QEAs @ 10 points	=	50 points	(10% of grade)
Research Project @ 100 points	=	100 points	(20% of grade)
TOTAL	=	500 points	

**Course Requirements:**

1. Adherence to departmental policies and procedures.
2. Regular class attendance as prescribed in the departmental requirements.
3. Read the material to be discussed in class prior to coming to class.
4. Complete and turn in homework, QEAs, and research project by due deadline.

**NOTE:**

1. Students will NOT automatically be dropped from class. Students who choose to drop must do so by the semester deadline! The last day to withdraw or resign from the university is Friday, 24 March, 2017.
2. If you are a qualified student with a disability seeking accommodations under the Americans with Disabilities Act, you are required to self-identify with the Office of Disability Services, War Memorial Student Union 1304.
3. Students' behavior/classroom decorum: "Free discussion, inquiry, and expression are encouraged in this classroom. Classroom behavior that interferes with either (a) the instructor's ability to conduct the class, or (b) the ability of the students to benefit from the instruction is not acceptable. Examples may include routinely entering class late or departing early; use of beepers, cellular telephones, or other electronic devices; repeatedly talking in class without being recognized; talking while others are speaking; or arguing in a way that is perceived as 'crossing the civility line.' In the event of a situation where a student legitimately needs to carry a beeper/cellular telephone to class, prior notice and approval by the instructor is required."
4. Academic Integrity. The academic community relies upon a high standard of integrity in the relations among its members. To the extent that this standard is not maintained, the good of the community suffers, and injustice (sometimes serious injustice) may be done. One of the most important aspects of academic integrity concerns the just measure of each student's academic accomplishments. These are ordinarily evaluated through written examination or submitted work. For such modes of assessment to operate fairly, it is essential that the instructor be assured that the work used to evaluate the student's performance is genuinely the student's own. It is also the responsibility of the student to uphold the academic integrity of the University. The use of unauthorized material, communication with fellow students during an examination, attempting to benefit from the work of another student and similar behavior that defeats the intent of an examination or other class work is unacceptable to the University. Cheating on examinations, plagiarism, improper acknowledgment of sources in essays and the use of a single essay or paper in more than one course without permission are considered very serious offenses and shall be grounds for disciplinary action.

## Course Outline & Reading Assignments (Revised 01/09/17)

Class meets on Mondays and Wednesdays from 2:00 pm to 3:15 pm

Week	Date	Topic	Readings Due	Work Due
<b>Module 1: Ergonomics Basics</b>				
1	Jan.11	Introduction to Ergonomics	<i>Introduction</i>	
2A	Jan.16	Martin Luther King Holiday		
2B	Jan.18	Introduction to Ergonomics (cont.)	<i>Introduction</i>	
3	Jan. 23 & 25	Human Anatomy, Posture, and Biomechanics	Chapter 1 (pp 51- 89)	
4	Jan. 30 Feb. 2	Anthropometry and Workstation Design (Homework #1)	Chapter 1 (pp 15 - 51)	
5	Feb. 6 & 8	How the Mind Works	Chapter 3	Homework #1
6	Feb. 13 & 15	Human Senses (Homework #2)	Chapter 4	
7	Feb. 20 & 22	Interaction with the Environment	Chapter 5	Homework #2
8	Feb. 27 Mar. 1	Mardi Gras Holiday		
9A	Mar. 6	MID-TERM EXAM	Review Module 1	
9B	Mar. 8	Research Project Update		
<b>Module 2: Ergonomics Applications and Interventions</b>				
10	Mar. 13 & 15	Manual Material Handling (Homework #3)	Chapter 11 & Handouts	
11	Mar. 20 & 22	Manual Material Handling (cont.)		
12	Mar. 27 & 29	The Upper Body at Work & Hand-Tool Design	Chapter 8	Homework #3
13	Apr. 3 & 5	Whole-Body Exertion	Chap. 2 & 6	
14	Apr. 10 & 12	Ergonomic Job Analysis	Handouts	
15	Apr. 17 & 19	Spring Break		
16	Apr. 24 & 26	Work Organization and Psychosocial Stress	Chapter 13	
17	May 1 May 3	Research Project Presentation		Term Project
18	May 10	FINAL EXAM	Overview	