Human Factors and Ergonomics
EIN 3241

Class Periods: MWF, Period 3 (9*:35 AM – 10:25 AM)*
Location: NZH 0112

Instructor:

Name: Jad A. Atweh, Ph.D.
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Office Phone Number: (352) 294-7724
Office Hours: Mondays and Wednesdays 10:30 AM – 11:30 AM (*or by appointment*)
Office Location: Weil 477

TAs/Graders:

Name: Makayla Shortino
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Office Hours: Tuesdays and Thursdays 10:30 AM – 11:30 AM
Location: Zoom

Name: Janna Scholtz
Email Address: jscholtz@ufl.edu
Office Hours: Mondays and Wednesdays 3 PM – 4 PM
Location: Weil 401

Course Description
Introduces the techniques/concepts to understand users and workplace requirements for the design of sociotechnical systems. Topics covered include methods for work measurement, human cognitive and physical capabilities and limitations, and workplace requirements. Applications for design, including computer displays, noise, repetitive, and high physical effort tasks, are presented.

Course Pre-Requisites / Co-Requisites
ESI 3215C (Data Analysis for Industrial Applications) with a minimum grade of C.

Course Objectives
At the conclusion of this course, students will be able to:
- Describe the meaning and importance of human factors and ergonomics
- Relate cognitive and physical capabilities and limitations of human to the design of human-machine systems
- Select and correctly use appropriate work measurement, human-machine system analysis, and design tools
- To be able to identify and modify task characteristics that enhance human performance, efficiency, and safety in workplaces.
- Apply human-machine system design principles to real-world problems through exercises

Relation to Program Outcomes (ABET):
This course contributes to ensuring that the following program educational objectives of our BSISE program are met: Within 5 years of graduation, BSISE graduates…
- Are successful professionals using industrial and systems engineering skills;
- Acquire advanced knowledge through continuing education or advanced degree programs;
- Are active leaders in their profession and/or community.

Outcome	Coverage
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	Medium
3. An ability to communicate effectively with a range of audiences	
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	Medium
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	Low
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Medium

Recommended Materials

- Lee, J.D., Wickens, C. D., Liu, Y. D. & Boyle, L.N. (2017). Designing for People: An Introduction to Human Factors Engineering (3rd Ed.) ISBN: 978-1539808008.
- Fundamentals of Industrial Ergonomics, Second Edition, B. Mustafa Pulat, ISBN-13: 978-0881339499

Course Modules:

- Module 1: Introduction and History of Ergonomics
- Module 2: Design, Evaluation, and Research Methods
- Module 3: Engineering Anthropometry
- Module 4: Physical Ergonomics
- Module 5: Cognitive Ergonomics
- Module 6: Design of Displays and Controls
- Module 7: Work Measurement
- Module 8: Work Area and Job Design

Course Schedule (Tentative)

Week	*Date*	*Lecture Topic*	*Deliverables*	*Module*
1	Friday, August 22	Syllabus, Course Introduction, & Ice Breaker		1
2	Monday, August 25	Applications of Human Factors		
	Wednesday, August 27	History of Human Factors and Ergonomics		
	Friday, August 29	Task Analysis & Design Methods		2
3	Monday, September 1	**Labor Day (No Classes)**		
	Wednesday, September 3	Evaluation Methods		
	Friday, September 5	Research Methods *(Homework 1 assigned)*		
4	Monday, September 8	Engineering Anthropometry		3
	Wednesday, September 10	Engineering Anthropometry		
	Friday, September 12	Engineering Anthropometry *(Homework 2 assigned)*	*Homework 1*	
5	Monday, September 15	Lab 1: Engineering Anthropometry Lab		
	Wednesday, September 17	Work Physiology		4
	Friday, September 19	Work Physiology	*Homework 2*	

6	Monday, September 22	Lab 2: EMG	*Lab 1*	
	Wednesday, September 24	Occupational Biomechanics		
	Friday, September 26	Occupational Biomechanics *(Homework 3 assigned)*		
7	Monday, September 29	Lab 3: Strength	*Lab 2*	
	Wednesday, October 1	Visual Sensory System		5
	Friday, October 3	Visual Sensory System	*Homework 3*	
8	Monday, October 6	Auditory & Somatosensory Systems *(Homework 4 assigned)*	*Lab 3*	
	Wednesday, October 8	Lab 4: Vision Screener		
	Friday, October 10	Cognition and Human Information Processing		
9	Monday, October 13	Cognition and Human Information Processing	*Homework 4*	
	Wednesday, October 15	Lab 5: Audiometer	*Lab 4*	
	Friday, October 17	**Homecoming Day (No Classes)**		
10	Monday, October 20	**Midterm (8:20 PM – 10:10 PM) – FLG 0280**		
	Wednesday, October 22	Visual Search & Signal Detection Theory		
	Friday, October 24	Visual Search & Signal Detection Theory *(Homework 5 assigned)*		
11	Monday, October 27	Lab 6: Eye Tracking		
	Wednesday, October 29	Design of Displays and Controls	*Lab 5*	6
	Friday, October 31	Design of Displays and Controls	*Homework 5*	
12	Monday, November 3	Time Studies		7
	Wednesday, November 5	Time Studies	*Lab 6*	
	Friday, November 7	Work Sampling		
13	Monday, November 10	Predetermined Motion Time Systems		
	Wednesday, November 12	Predetermined Motion Time Systems *(Homework 6 assigned)*		
	Friday, November 14	Work Area Design		8
14	Monday, November 17	Job Design		
	Wednesday, November 19	Job Design	*Homework 6*	
	Friday, November 21	Project Presentations		
15	Monday, November 24	**Thanksgiving Break**		
	Wednesday, November 26			
	Friday, November 28			
16	Monday, December 1	Project Presentations		
	Wednesday, December 3	Project Presentations		
	Thursday & Friday (December 4 & 5)	**Reading Days**	*Final Report*	
17	Wednesday, December 10	**Final Exam (10:00 AM – 12:00 PM)**		

Grading Scheme – How will I demonstrate my knowledge and be assessed?

Assessment	Base Weights	Oops! I did poorly on the midterm	I froze up on the final	I struggled along the way but nailed the final
In-Class Activities	5%	5%	5%	5%
Homework Sets & Lab Reports	20%	20%	20%	15%
Midterm	25%	15%	30%	15%
Project	20%	25%	25%	20%
Final	30%	35%	20%	45%

Grading Policy

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

- A C is required to pass this course. A C- is NOT a passing grade.

Project Policies

- Peer evaluations will be conducted multiple times during the semester and will cover criteria such as attendance in team meetings, report writing, presentation delivery, and general work ethic.
- **Peer Evaluation grades may bump your grade up or down.** While the proposal and report receive a group grade, the individual grade may be modified based on individual contributions reported in peer evaluations.

Policies we hope never affect you! (not taking the midterm, late work, team members not contributing…)

- Please note that the midterm exam date will be scheduled at the beginning of the semester and announced in advance. This will give you time to make arrangements. Students are expected to prioritize this date.
- If health, disabilities, or family emergencies activities prevent you from turning in work on time, talk to me as soon as you can! Otherwise, no credit will be assigned to assignments submitted after the deadline.
- If a group member contributes minimally or not at all on a case, please email or talk to Dr. Atweh.
- We hold the Honor Code in high esteem! If you are caught cheating, your work will receive a zero and you will receive a failing grade in the course. This is separate from any pursuit of an Honor charge.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives within our community and is committed to supporting the University's core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Undergraduate Coordinator
• HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
• Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu

University Academic Policies & Campus Resources

For official academic policies and student support resources, please refer to the University of Florida's syllabus policies: https://go.ufl.edu/syllabuspolicies. This includes information on attendance, grading, academic integrity, accommodations for students with disabilities, course evaluations, in-class recording policies, library services, and other valuable campus support.