

IH&S 460 - Ergonomics Fall 2018

Description: Study of human-machine system with an emphasis on improving the human performance. The course provides the students with the technical foundation required to understand and evaluate the fundamental components of the human-machine system.

Course Objectives:

1. To understand various modes of information input and humans information processing.
2. To be able to quantify the human output, abilities, and limitations within human-machine system.
3. To learn the techniques used to quantitatively and qualitatively evaluate tools, machines, systems, tasks, jobs, and environments of human-machine system.
4. To be able to identify and modify equipment or task characteristics that enhance human performance, safety, and well-being within the human-machine system.

Instructor: Dr. Ashish D. Nimbarte, Associate Professor, IMSE Department

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Office Hours: 4:00 pm to 5:00 pm TR, or by appointment

Lectures: 2:30 pm to 3:45 pm TR, MRB-E 205

Text Used: Sanders and McCormick (1993) Human Factors in Engineering and Design 7th Ed. ISBN: 007054901X

References: Current technical articles and library sources.

Prerequisites: IENG 213 or a first course in Statistics addressing distributions and hypothesis testing.

Final grade is weighted as follows:

Quizzes & Homework	15%	90-100%	= A
First Test	17%	80-89%	= B
Second Test	16%	70-79%	= C
Third Test	16%	60-69%	= D
Final Exam	26%	<59%	= F
Class Project*	10%		
	100%		

No late homework are accepted. No make-up exams are given.

Statement on Attendance: Attendance is mandatory. Students who are absent from class for any reason are expected to take full responsibility for their own academic work and progress and are required to complete missed work or equivalent work, as deemed appropriate by the instructor. Regarding the excused absences the WVU attendance policy (<http://catalog.wvu.edu/undergraduate/enrollmentandregistration/#Attendance>) will be followed:

Academic Integrity Statement: The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, instructors will enforce rigorous standards of academic integrity in all aspects and assignments of their courses. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University Academic Standards Policy (<http://catalog.wvu.edu/undergraduate/coursecredittermsclassification>). Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see your instructor before the assignment is due to discuss the matter.

Inclusivity Statement: The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in your classes, please advise your instructors and make appropriate arrangements with the Office of Accessibility Services.

(<https://accessibilityservices.wvu.edu/>). More information is available at the [Division of Diversity, Equity, and Inclusion](https://diversity.wvu.edu/) (<https://diversity.wvu.edu/>) as well.

To review the various WVU Academic Policies please visit <https://tlcommons.wvu.edu/syllabus-policies-and-statements#10>

Course Topics:

Week	Date	Lecture Topic	Textbook Chapters	Exam	Final	
1	16-Aug-18	Introduction to Human Factors Engineering	1	Introduction		
2	21-Aug-18	Information Input and Processing Information Processing Theory Signal Detection Theory	3	Human Information Processing		
	23-Aug-18					
3	28-Aug-18					
	30-Aug-18					
4	4-Sep-18	Static and Dynamic Visual Display	4,5			
	6-Sep-18					
5	11-Sep-18	Auditory Display	6			
	13-Sep-18	Tactual and Olfactory Displays				
6	18-Sep-18	Musculoskeletal System and Physical Work	8,9	Human Output and Control		
	20-Sep-18					
7	25-Sep-18	1st Exam				
	27-Sep-18					
8	2-Oct-18	Occupational Biomechanics and Manual Materials Handling				
	4-Oct-18					
9	9-Oct-18					
	11-Oct-18					
10	16-Oct-18	Applied Anthropometry	13		Workplace Design	
	18-Oct-18	(Due date for making class project selection)				
11	23-Oct-18	2nd Exam				
	25-Oct-18	Applied Anthropometry	13			
12	30-Oct-18	Illumination	16	Workplace Environmental Conditions		
	1-Nov-18	Climate	17			
13	6-Nov-18	Noise	18			
	8-Nov-18	Vibration	19			
14	13-Nov-18	Evaluation of Physical Space	10			
	15-Nov-18	3rd Exam				
15	20-Nov-18	Fall Recess				
	22-Nov-18					
16	27-Nov-18	NIOSH Lifting Equation	8,9			
	29-Nov-18	Job Severity Index				
17	4-Dec-18	Human Factors Research Methodologies	2,21,22			
	6-Dec-18	Final Exam Review (Due date for final project report submission)				
18	14-Dec-18	Final Exam – 8 am to 10 am				

***Class Project: The following three options are available for class project:**

- 1) Critical review of a research article: class presentation and report submission
- 2) Review of existing research papers (at least 15) on a contemporary ergonomics problem and report submission
- 3) Lab project that involves data collection, processing and report preparation

List of Journals for options 1 and 2:

- 1) Ergonomics (publisher: Taylor & Francis); 2) Applied Ergonomics (publisher: Elsevier)
- 3) International Journal of Industrial Ergonomics (publisher: Elsevier); 4) WORK: A Journal of Prevention, Assessment & Rehabilitation (publisher: IOS press); 5) IIE Transactions on Occupational Ergonomics and Human Factors (publisher: Taylor & Francis)

Class presentations will be conducted in the week of 3-Dec-17