IE-341
Section 1, CRN: 62596/62597/80531-91742

Second Semester 1446 (Spring-2025) – 3(2,1,2)
"HUMAN FACTORS ENGINEERING"

Course Description

Course-in-brief

Introduction to Human Factors; Human-Machine Systems; Information Theory; Human capabilities and Speech Communications; Display and Control Design; Hand Tools and Devices; Workplace Design; Environmental and Thermal factors; Physical Work and Manual Materials Handling.

Level: 7 (for more details: https://engineering.ksu.edu.sa/en/Bachelor_of_Science_in_IE)

Estimated Category Content:
Engineering science: 1.5 credit hours
Engineering design: 1.5 credit hours

Prerequisite: IE 333 – Design and Analysis of Experiments (Level 6)

Co-requisite: None

Time and Place

Section 1	
Lecture (62596): **Sun: 09:00 – 09:50 AM** **Tue: 09:00 – 09:50 AM** 1 A 52 Dr. El-Sherbeeny	
Tutorial (62597): **Thu: 09:00 – 09:50 AM** 1 A 52 Dr. El-Sherbeeny	
Lab (80531): **Tue: 03:00 – 04:50 PM** Ergonomics Lab Engr. Ahmed Tawheed	Lab (91742): **Sun: 03:00 – 04:50 PM** Ergonomics Lab Engr. Ahmed Tawheed

Course Resources

Resources for the course include the instructor; textbook; references; class notes and handouts; your teammates; the library; and the World Wide Web.

Instructor

Ahmed M. El-Sherbeeny, PhD
Office: Room A2-128/1; email: aelsherbeeny@ksu.edu.sa
Web Site: https://faculty.ksu.edu.sa/en/aelsherbeeny
Phone (Office): +966-(0)11-496-8535

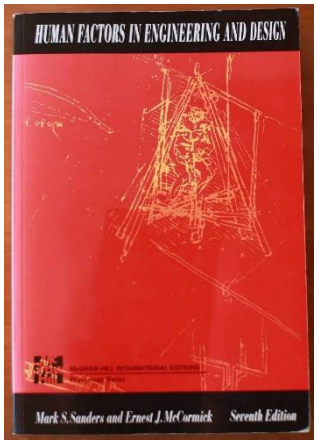
Teaching Assistants

Ahmed Tawheed, BSME; email: asoluman@KSU.EDU.SA
Office: Ergonomics Lab (G-A-65)
Phone (Office): +966-(0)11-499-6422

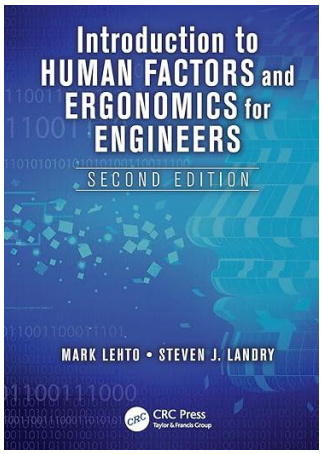
Office Hours

Office hours can be conducted physically or via Zoom, phone, email. Best times to find me in the office this semester are:
Dr. El-Sherbeeny: **Sun, Mon, Tue, Wed: 03:00 – 05:00 PM**; or by appointment.

Textbook: ***Human Factors in Engineering and Design***.
Mark S. Sanders, Ernest J. McCormick.
Seventh Edition.
McGraw: New York, 1993.
ISBN: 0-07-112826-3.



Reference:
Introduction to Human Factors and Ergonomics for Engineers.
Mark Lehto, Steven J. Landry.
Second Edition.
CRC Press: Boca Raton, 2013.
ISBN: 978-1-4398-5394-8.



Project Work

You will be asked to perform a literature review and analysis related to advances on one of the human factors engineering topics discussed in this course. More details will be provided at a later stage in the course.

Course Objectives

The course introduces students to the field of human factors engineering so that they can make full recognition of the abilities and limitations of human beings (operator or user) in order to enhance certain desirable values such as safety, job satisfaction, efficiency, and wellbeing. The course helps the student in understanding how to optimize the relationship between people and technology.

Intended Learning Outcomes (ILO's)

At the end of this course, students are expected to:

1. Identify Human Factors Engineering design problems, and recognize related principles to solve found problems. [SO1].
2. Conduct Human Factors Engineering experiments, interpret and analyze results, and be able to draw conclusions. [SO6].
3. Design, develop, and/or improve a human-machine system under realistic constraints. [SO2].
4. Recognize ethical principles and norms of Human Factors Engineering practice, and identify their impact in global, economic, environmental, and societal contexts. [SO4].

Course Policies

Homework Policy

Problems will be assigned and collected often. We will try our best to grade and promptly return the results to you in order to stay up-to-date with your progress in the course. Your solution must be organized and neat, otherwise it will be returned to you ungraded.

Attendance

Attendance is a must! Attendance will be taken at the **first minute** of each class period (lecture, tutorial, and lab). The policy for considering attendance is as follows (please take serious note of this):

- If you are present at the time of taking attendance (in your **official section**) you are considered **present**.
- If you arrive late for your official section, then you are counted as **half-present**, so long as you arrive before mid-session (i.e. within the first 25 minutes); if you arrive later than that, then you are counted as absent.
- If you arrive at the time of taking attendance in a section other than yours, then you are counted as **half-present**; if you arrive later than that, then you are counted as absent.
- If you are absent with a valid excuse, you must bring the original excuse within one week for it to be counted.

Students who absent themselves during a semester for more than 25% of the required number of lectures will not be allowed to continue the course, denied from sitting for the final examination, and assigned a course grade of DN, which is reported in their transcript. Note, please make note of the important college decision below regarding attendance during the first day of classes.

> *"10. The deprivation from entering the final exam due to the absence (25% including lectures, tutorials, and labs) is calculated from the first week."*

Class Discussion

Communication is very important in achieving collective goals and objectives. Feel free to voice your opinions and ask questions anytime during a class period. Practice your right and freedom to learn.

Help Sessions

Help sessions will be organized at convenient times as needed upon request from students.

Make-up Tests and Late Homework Policy

No makeup test will be given and late homework will not be accepted unless the reason is beyond the student's control. A valid, official excuse must be presented.

Expected Behavior

Practicing engineers are expected to conduct themselves in an ethical and professional manner. This includes attending all class activities; meeting deadlines; observing common courtesies to fellow students, teachers, and staff; being honest; making a diligent effort to learn; and not engaging in any disruptive, irresponsible manner. Legitimate collaboration is encouraged but academic dishonesty will not be tolerated.

Assessment and Evaluation

Many aspects of the course will receive on-going, real-time assessments and feedback to help improve students' performance. This will be done by discussing performance in class and by arranging individual meetings.

Assessment in the following areas will be converted to points, to compute your final grade in the course:

Assessment Item	Comment	Points*
Attendance	Used only to assess denial status	0%
Homework	2-3 Homework Assignments	5%
Project	One semester project; Due end of 13th Acad. Week: **Saturday, Apr. 26, 2025 (28/10/1446H)***	15%
Lab activities	Participation; Reports; Quizzes	15%
Quizzes	Assigned once every 2-3 weeks	5%
Midterm	One midterm (End of 7th Acad. Week): **Midterm: Saturday, Feb. 22, 2025 (23/8/1446H)***	20%
Final Exam	Exams period (Exams Week 2): **Saturday, May 24, 2025 (26/11/1446H): 8:00 – 11:00 AM**	40%

**** Tentative***

Course Curriculum:

Course topics*:

1.	Introduction to human-machine systems	(1 week)
2.	Information input and processing	(1 week)
3.	Human capabilities: vision, hearing, and speech communications	(2 weeks)
4.	Human-machine interfaces, display design	(1.5 weeks)
5.	Control design, feedback and control	(1 week)
6.	Hand tools and devices	(1 week)
7.	Physical work and manual materials handling	(1.5 weeks)
8.	Workplace design	(1 week)
9.	Work-related musculoskeletal disorders	(1 week)
10.	Environmental and thermal factors, lighting, air pollutants, noise, vibration	(1 week)
11.	Ergonomic work assessment techniques	(1 week)
12.	Design applications	(1 week)

Laboratory topics*:

1.	Determination of reaction time under noise	(1 session)
2.	Determination of reaction time with multiple alternatives	(1 session)
3.	Anthropometric measurements and applications	(2 sessions)
4.	EMG (Electromyogram) measurement	(1 session)
5.	ECG (Electrocardiogram) measurement	(1 session)
6.	Skin resistance	(1 session)

**** Tentative***