

INSY 7080(D)– Human Factors Engineering

Auburn University
Department of Industrial & Systems Engineering
Fall 2021

Course Description: (3 semester hours). This course is an introduction to the discipline of Human Factors Engineering. Human Factors Engineering is the science of designing products and systems for optimal human well-being and system performance. This course will focus on information processing and the cognitive aspects of ergonomics design. Students will gain insight into the effects of various environments (hot, cold, noise, information overload, etc.) on humans and human performance. Physical ergonomics will be addressed somewhat as well. Emphasis is on human information input, output and control processes with the objective of optimizing integration of the human into simple and complex systems.

Learning Objectives:

1. Understand basic human capabilities and limitations with respect to system performance.
2. Understand how humans receive and process information and how this can sometimes result in system errors.
3. Understand basic control/display relationships, population stereotypes, and compatibility between control operation and desired system output.
4. Understand the implications of human factors engineering for workplace design.
5. Understand the impact of various environments on human perceptions and performance.
6. Be able to apply human factors engineering concepts in the evaluation of existing systems and in the design of new systems.

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Meetings: T / Th 2:00 pm - 3:15 pm Shelby 1122

Texts: **Designing for People: An Introduction to Human Factors Engineering**, 3rd Edition by Lee, Wickens, Liu, and Boyle (CreateSpace, ISBN # 978-1539808008).

Human Factors in Engineering and Design, 7th Edition by Sanders and McCormick (McGraw Hill, ISBN # 978-0070549012).

Office Hours: By appointment.

Justification for Graduate Credit: This graduate course is more advanced in academic content than those typical of an undergraduate program. The course fosters independent learning, according to SACS guidelines, as demonstrated through the completion of independent assignments.

Emergency Contingency Statement: If normal class and/or lab activities are disrupted due to illness, emergency, or crisis situation (such as a COVID-19 outbreak), the syllabus and other course plans and assignments may be modified to allow completion of the course. If this occurs, an addendum to your syllabus and/or course assignments will replace the original materials.

Attendance: While attendance is highly recommended, it will not be an explicit factor in the course grade. Please be aware that this class is also administered via the Graduate Outreach Program (<https://auonline.eng.auburn.edu/>). Students are responsible for all materials covered in class videos. Students are expected to submit materials (homework, project materials, exams) on or before due dates. If mplete your work or exams on time, please consult the student handbook (www.auburn.edu/tigercub/) for information on "Tiger Cub" (Auburn approved) excuses.

Evaluation of Student Performance: Learning is assessed through homework and examinations. The cumulative grade for the course is determined based on performance on each of the assessment methods, weighted:

HOMEWORK (4 @ 25 each)	100
PROJECT FINAL	150
MIDTERM EXAM	100
FINAL EXAM	150
TOTAL	500

Letter grades will be assigned based on the percentage of points earned as follows:

≥ 90%	A
≥ 80-90%	B
≥ 70-80%	C
≥ 60-70%	D
< 60%	F*

***academic misconduct can result in an "F" regardless of percentage of points earned**

Assignments:

Homework assignments and reports must be typed and presented in a professional manner. Unless otherwise stated, homework assignments are to be completed on an individual basis. Several homework assignments will require creation of voice-over PowerPoint (or similar video presentation) of your work. These homework assignments may be shared with the entire class.

The semester project will entail a real world human factors analysis/evaluation of a system. Past projects have included usability analysis of web sites, industrial workstation evaluation with corrective recommendations, product evaluation/beta testing of a consumer product, or interface evaluation for a vehicle. You will receive specific instructions explaining your project and project requirements during the semester.

Work (presentations/exams) from unexcused absences cannot normally be made up. However, *at the instructor's discretion*, some late work may be allowed. Assignments and lecture notes will be posted on the course Canvas website.

The tentative lecture schedule shows the text material to be covered each "class period." It is recommended that students read the material before viewing the class lecture. Due dates, holidays, and exam dates are also listed.

The schedule should be adhered to as closely as possible. There is no penalty for early completion of work. If you have any questions regarding assignments, please email your instructor at mark-schall@auburn.edu

Students are responsible for all material covered as part of this class (including materials posted on Canvas). Lecture materials identified as "required" is considered mandatory to the class. Non-mandatory, supplemental material will be identified as such. Supplemental materials are considered "fair game" for potential extra credit questions, but will not be included in the core exam material.

The work (homework, design projects, reports, and tests) submitted for grading should represent your individual effort. However, studying and working with your peers (on outside class assignments) is not only acceptable, but encouraged. Study groups can provide an extremely valuable resource to students, and you are encouraged to join them when possible.

Submitting work copied from others is considered academic misconduct. Plagiarism of ideas or work as well as giving or receiving unauthorized information on examinations is considered academic misconduct. All academic misconduct will be dealt with severely and may result in a course grade of "F." Refer to University Regulations and the student handbook for complete information on your rights and responsibilities as a student.

Accommodations: Students who need accommodations are asked to contact the Auburn University Office of Accessibility: <http://accessibility.auburn.edu/> to arrange a meeting during the first week of classes, or as soon as possible if accommodations are needed immediately. Bring a copy of the Accommodation Memo to the meeting. If the student does not have the necessary paperwork, an appointment with The Program for Students with Disabilities should be made, 1244 Haley Center, 844-2096.

Academic Honesty: ALL PORTIONS OF THE AUBURN UNIVERSITY STUDENT ACADEMIC HONESTY CODE (TITLE X11) FOUND IN THE TIGER CUB WILL APPLY TO THIS CLASS. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee.

Violations include, but are not limited to: Cheating on an examination, such as copying from another's paper, using unauthorized notes, calculators, etc., or giving or receiving unauthorized aid, such as trading examinations, whispering answers, passing notes, or using electronic devices to transmit or receive information.

Plagiarism: This is using someone else's work without giving credit. It is, for example, using ideas, phrases, papers, laboratory reports, computer programs, data - copied directly or paraphrased - that you did not arrive at on your own. Sources include published works such as book, movies, Websites, and unpublished works such as other students' papers or material from a research service. In brief, representing someone else's work as your own is academically dishonest. The risk of plagiarism can be avoided in written work by clearly indicating, either in footnotes or in the paper itself, the source of any major or unique idea or wording that you did not arrive at on your own. Sources must be given regardless of whether the material is quoted directly or paraphrased.

Unauthorized collaboration: This is working with or receiving help from others on graded assignments without the specific approval of the instructor. If in doubt, seek permission from the instructor before working with others. Students are encouraged to learn from one another: Form study groups, discuss assignments, BUT each assignment must be individual work unless specifically stated and turned in as a group assignment.

- Copying another student's assignment and putting your name on it is plagiarism.
- You are encouraged to talk to one another about your assignments; however, all assignments must be done by the student whose name is on it!

Multiple submission: This means using the same work to fulfill the academic requirements in more than one course. Prior permission of the instructors is essential.

Exam Proctoring: The course exam(s) will be taken through Canvas using the ProctorU on-line proctoring system. In order to use ProctorU, you will need a high-speed internet connection, a webcam (internal or external), a Windows or Apple operating system, and a government-issued photo ID, student ID or Passport. If your cell phone (or smart watch) is in the room, you may receive a zero on the test and the video tape may be sent to the Academic Honesty Committee.

The University Honor Code applies: "I acknowledge I am aware of the Auburn University policy concerning academic honesty, plagiarism, and cheating. This policy is defined in the current Tiger Cub Student Handbook, Code of Laws, Title XII, Student Academic Honesty Code, Chapters 1200-1203. I further attest that the work I am submitting with this exam is solely my own and was developed during the exam. I have used no notes, materials, or other aids except those permitted by the instructor."

More on using ProctorU is available here: <http://wp.auburn.edu/biggio/proctoru-information/>

Diversity and Inclusion Statement: It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs to be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, religion, sexuality, disability, age, socioeconomic status, veteran status, ethnicity, race, and culture. All students in this course are expected to respect their fellow classmates and actively participate in fostering an inclusive learning environment. If you experience anything in this class that makes you feel uncomfortable, please bring it to my attention and we will formulate a response. If you would prefer to remain anonymous you may complete a Bias Incident Report which will maintain your confidentiality at: <http://studentaffairs.auburn.edu/bert/submit-a-report-of-bias/>

Tentative Course Schedule

(Instructor reserves the right to modify as deemed appropriate)

*Chapter references refer to the Lee et al. text

Week	Topic*
1	Class 1: Welcome & Course Overview Class 2: Introduction to Human Factors Engineering (Chapter 1)
2	Class 3: Design and Evaluation Methods (Chapters 2 and 3) Class 4: Design and Evaluation Methods cont. (Chapters 2 and 3) Due: HW0 (8/26/21)
3	Class 5: Nathan Dorris, PhD, CPE - Guest Lecture about Bad Designs Class 6: Information Input and Processing Due: HW1 (9/2/21)
4	Class 7: Visual Sensory System (Chapter 4) Class 8: Visual Sensory System cont. (Chapter 4)
5	Class 9: Andy Wise, Au.D. & Kara Schall, CCC-SLP – Guest Lecture on Auditory / Speech Systems Class 10: Auditory, Tactile, and Vestibular Systems (Chapter 5) Due: HW2 (9/16/21)
6	Class 11: Attentional Resources and Memory (Chapter 6) Class 12: Decision-Making (Chapter 7)
7	Class 13: Displays and Controls (Chapters 8 and 9) Class 14: Displays and Controls cont. (Chapters 8 and 9) Due: HW3 (9/30/21)
8	Class 15: Midterm Review Class 16: No class -- Fall Break
9	Class 17: Midterm Exam (due 10/12/21) Class 18: Exam Feedback (if possible) and Introduction of Final Project
10	Class 19: Usability and Human Computer Interaction (Chapter 10) Class 20: Usability and Human Computer Interaction cont. (Chapter 10)
11	Class 21: Workspace Design and the Environment (Chapter 12) Class 22: Workspace Design and the Environment cont. (Chapter 12) Due: HW4 (10/28/21)
12	Class 23: Work Physiology and Human Factors Design (Chapter 14) Class 24: Work Physiology and Human Factors Design cont. (Chapter 14)
13	Class 25: Neuroergonomics and Neuromuscular Control Class 26: Industry 4.0 Technologies for Human Factors Due: Final Report (11/11/21)
14	Class 27: TBD Class 28: Project Presentations
15	Thanksgiving Break
16	Class 29: Final Review Class 30: Cumulative Final Exam (due 12/2/21)

COVID Related Policies

In response to COVID-19, and in alignment with Auburn University's Presidential and national health official guidelines, face coverings will be required at all times in this class until otherwise indicated. A "face covering" is defined as a "covering that fully covers a person's nose and mouth, including without limitation, cloth face mask, surgical mask, towels, scarves, and bandanas." If a student has a medical exception to the face covering requirement, please contact the Office of Accessibility to obtain appropriate documentation.

The course schedule and assignments are designed with the most up-to-date information and policies in mind. If the situation changes I will make every effort to keep the schedule as consistent as possible; however, please note that the due dates for assignments and tests may be changed during the semester in response to the changing health and safety requirements or policies of the University. When changes are made, they will be communicated via Canvas Announcement or Canvas message.

Students testing positive for COVID-19, exhibiting COVID-19 symptoms or who have been in direct contact with someone testing positive for COVID-19 will not be allowed to attend in-person instructional activities and must leave the venue immediately. Students should contact the [Student Health Center](#) (Links to an external site.) or their health care provider to receive care and who can provide the latest direction on quarantine and self-isolation. Contact your instructor immediately to make instructional and learning arrangements.

If I become ill or unable to lead the class, a backup instructor will be identified and they will communicate any changes or updates to the course schedule or mode of instruction as soon as possible.

When we meet on Zoom, your attendance, attention, and participation are expected. Zoom participation requires you to keep your video on and your microphone muted when you are not speaking. Although you may be participating from your domicile, our Zoom meetings are professional interactions. You should dress and behave as you would in a normal face-to-face classroom. To the extent possible, please minimize distractions in the background. I reserve the right to dismiss anyone from a Zoom meeting whose environment or behavior is distracting or problematic. If you have any issues with sharing your video feed, adhering to this policy, or anything else related to your use of Zoom please notify me via email in the first week of class. I'm happy to consider and provide accommodations, but you will need to be in communication with me.

Your health and safety, and the health and safety of your peers, are my top priorities. If you are experiencing any symptoms of COVID-19, or if you discover that you have been in close contact with others who have symptoms or who have tested positive, you should not attend in-person classes. You will not be penalized for such an absence nor will you be asked to provide formal documentation from a healthcare provider. My hope is that if you are feeling ill or if you have been exposed to someone with the virus, you will stay home to protect others. I don't want the need for documentation to discourage you from self-isolating when you are experiencing symptoms. Please do the following in the event of an illness or COVID-related absence:

- Notify me in advance of your absence if possible
- Keep up with coursework as much as possible
- Participate in class activities and submit assignments electronically as much as possible
- Notify me if you require a modification to the deadline of an assignment or exam

Finally, if remaining in a class and fulfilling the necessary requirements becomes impossible due to illness or other COVID-related issues, please let me know as soon as possible so we can discuss your options.