Course Syllabus

IE 1061 – Human Factors Engineering
Section 1-Spring 2024

Sichuan University-Pittsburgh Institute
Wednesday 8:15 am - 11:00 am, Room 3-106, Zone 3, Liberal Arts Building

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 for human use. 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, noisy, information overload, etc.) on humans and human performance. Physical ergonomics (cumulative trauma disorders and biomechanics) will be addressed briefly. Physical ergonomics topics are covered in more depth in *IE Technical Elective Introduction to Ergonomics*.

PREREQUISTIES:

None

COURSE OBJECTIVES:

1) Have an understanding of basic human capabilities and limitations with respect to system performance.
2) Gain an understanding of 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.

INSTRUCTOR: Ruoliang (Rio) Tang, PhD, 4-221 Zone 4, 19136151636 (mobile), rio.tang@scupi.cn

TAs: Zhuoxun Wu, 3-314, Zone 3, 2020141520058@stu.scu.edu.cn

TEXT or REFERENCE BOOKS:

1) **Human Factors in Engineering and Design**, 7th Edition by Sanders and McCormick (McGraw Hill, ISBN # 978-0070549012). It is also recommended that students purchase a 3-ring binder so that additional information can be added as it is handed out during the semester.
2) **An Introduction to Human Factors Engineering**, 3rd Edition by Lee, Wickens, Liu, Boyle (Pearson)

OFFICE HOURS: Dr. Tang: W/TR 11am-2pm; Zhuoxun: TBD and by appointment

ATTENDANCE:

It is your decision whether or not to attend class. However, you are responsible for all materials covered in class. Please refer to student handbook for information on absence excuses. If you are absent for any non-excused reason, please obtain the handouts from Blackboard and contact your classmates for any pertinent material. DO NOT see the instructor for notes or handouts or a "review" of unexcused absences.

EVALUATION:

Evaluation:	
HOMEWORK (4 @ 50 each)	200
LAB REPORT (3 @ 100 each)	300
EXAM 1 (Mid-term I)	100
EXAM 2 (Mid-term II)	100
EXAM 3 (Final)	300
TOTAL	1,000

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Grade Ranges (Class may be "curved", but below grades are assured)

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

***academic misconduct can result in an "F" regardless of %**

The project report will entail a real-world human factors analysis/evaluation. For example, projects might include usability analysis of commercial websites, industrial workstation evaluation with corrective recommendations, product evaluation/beta testing of a consumer product, or interface evaluation for a vehicle. All projects must be approved by Dr. Tang/TAs.

Homework, computer/lab assignments will be given in the lectures and lab sessions. Due dates for each assignment will also be post to Blackboard. Homework assignments and lab reports must be typed and presented in a professional manner. Unless otherwise stated, homework assignments and lab assignments/reports are to be completed on an individual basis. Homework assignments and lab assignments/reports may require presentation to the class (a subset will be selected for class discussion – you should be prepared to present your work). Semester project reports require a written report and a final presentation to the class (or video presentation). **Late work will receive a penalty of up to 10% per day. If the student work is not submitted within 2 weeks from the due date, you will receive "0" for your grade. Work (presentations/exams) from unexcused absences cannot normally be made up. However, *at the instructor's discretion*, some work may be made up with penalty.** You are responsible for ALL materials posted to Blackboard (assignments and lecture notes). These materials may include: papers, videos, lectures, HW problems/explanations, classmate presentations, and reference materials. Some optional/supplemental materials may also be posted to Blackboard. These optional materials will NOT be directly tested, but may represent extra credit questions on the exams. These materials are intended to supplement and enhance the materials presented in class and discussed in the text.

The lecture schedule shows the text material to be covered each class period. It is recommended that students read the text prior to the class lecture. Due dates, holidays, and exam dates are also listed. The schedule will be adhered to as closely as possible; however, some changes will undoubtedly be required (particularly to schedule any guest lecturers). Changes to the schedule (due dates, additional information provided, etc.) will be announced during the lecture period. You are responsible for noting these changes.

Extra credit may be earned (up to 2.5%). You can earn up to 1% by providing classroom demonstrations, props/models, or case studies. Participating and sharing ideas in Blackboard online forums can earn up to 1 % and demonstrating an Ergonomic solution to a problem for someone else (at work, home, or play) can earn up to 1%.

ACCOMMODATIONS:

Students who need accommodations are asked to arrange a meeting during the first week of classes.

COURSE SCHEDULE

Schedule

Week	Date	Classroom Topics	Chapters
1	2/28	Introduction to Human Factors Engineering, Human Factors and Systems.	1-3
2	3/6	Human Factors Research Methodologies. Information **Homework 1 assigned.** Semester project introduction.	2,3
3	3/13	Text, Graphics, Symbols, and Codes. Visual Displays of Dynamic Information. **HW 2 & 3 assigned**.	4,5
4	3/20	Auditory, Tactual, and Olfactory Displays; Speech Communications. **HW 1 due.**	6,7

5	3/27	**** EXAM 1 (Mid-term I) ****	
6	4/3	Human Output and Control: Physical Work and Manual Materials Handling	8
7	4/10	Motor Skills. **HW 4 assigned**	9
8	4/17	Human Control of Systems; Controls and Data entry Devices. Hand Tools and Devices.	10-12
9	4/24	Workplace Design: Applied Anthropometry, Workspace Design and Seating. **HW 2 due**	13-15
10	5/1	**Holiday**	
11	5/8	**** EXAM 2 (Mid-term II) ****	
12	5/15	Arrangement of Components within a Physical Space; Interpersonal Aspects of Workplace Design.	14,15
13	5/22	Environmental Conditions: Illumination & Lab	16
14	5/29	Environmental Conditions: Climate & Lab	17
15	6/5	Environmental Conditions: Noise & Lab **HW 3 due**	18
16	6/12	Human Factors and the Automobile.	19,20
17	6/19	Human Factors in Systems Design. **All extra credit due. HW 4 due 6/21**	21,22
18	6/26	**Final Exam (Exam 3)**: **Note: the duration is 2 hours. Material from project and homework presentations will be incorporated into the final exam.**	

Important! Please Note: The **schedule is subject to change** based on availability of guest lecturers and the classroom driven, interactive nature of this course. All topics will be covered, but order may vary. Plan on attending all scheduled class sessions!

Meetings: Class meets on Wednesdays from 8:15 am to 11:00 am in 3-106 Zone 3. **Class will meet on all dates** listed **on** this **schedule**. If presentation order alters significantly from this schedule, a revised schedule will be provided (posted online). Grading, however, will be as described on this syllabus.

Expect that **all material** from the text and all topics on this schedule **will be covered**. **You will be responsible for all material** presented in class, in the text, in homework assignments, and in handouts.

ACADEMIC HONESTY:

Students are responsible for all material covered as part of this class (including both graded and ungraded assignments posted on Blackboard). The work (homeworks, lab reports, design projects, reports, and tests, etc.) submitted for grading should represent your individual effort. However, studying and working with your peers (on outside class assignments) is not only acceptable, but greatly encouraged. Study groups can provide an extremely valuable resource to students, and you are encouraged to form one.

In general, 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 school policy and the student handbook for complete information on your rights and responsibilities as a student.

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 (**such as copying the word, powerpoint, or excel spreadsheet assignment of another student**).

Violation of proctor guidelines and/or otherwise thwarting the "chain of custody" (such as copying or sharing exam questions before *or* after an exam) for an exam **is considered cheating** and grounds for failure in this course.

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 unless you are specifically assigned to a "team" assignment.

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.*