**American University of Beirut**
**Faculty of Engineering and Architecture**
**Industrial Engineering and Management Department**

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INDE 421: Human Factors Engineering
Fall 2023: M & W @ 2:00 pm – 3:30 pm
Bechtel Engineering Building, Rm 202

Instructor: Dr. Karim Zahed E-mail: kz28@aub.edu.lb
Office: Bechtel 419
Office Hours: M: 3:30 pm – 5:00 pm; and/or by appointment

Lab Instructor: Mrs. Maysaa Jaafar Email: mj73@aub.edu.lb
Graduate Assistant: Ms. Rawan Hallal Email: rah130@aub.edu.lb

**Course Description:** Introduces human factors and ergonomics. Analysis and design of systems considering human characteristics, capabilities, and limitations. Designing for human performance effectiveness, productivity, and comfort. Topics include design and evaluation methods; perception-vision and hearing; information processing; display and control design; workplace design; environmental effects on worker performance; biomechanics of work; stress and workload; safety and human error; and human-computer interaction.

**Pre-requisite:** INDE 320.

**Learning Outcomes**
Students will be able to:

1. Explain the basic concepts of human factors and the importance of considering human capabilities and limits in system design.
2. Design the workspace, tools, interfaces, and tasks to match the physical, physiological, biomechanical, and mental capability of a worker.
3. Describe human anatomy, metabolic monitoring, strength measurements, anthropometric measurements, and visual and hearing tests.
4. Explain cognitive ergonomics including workload and stress, visual displays, controls, decision-making and errors, and workstation design.
5. Collect and analyze data using ergonomic tools, equipment, and software.
6. Conduct and present a Human Factors/Ergonomics related project.

**Textbook:** Designing for People: An Introduction to Human Factors Engineering; 3rd edition John Lee, Christopher D. Wickens, et al.; ISBN: 978-1539808008, CreateSpace Independent Publishing Platform

**Final Grade Weighting**

| Category | % |
|---|---|
| Class Participation | 5 |
| Labs | 15 |

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| Homework/In-class exercises/Quizzes | 15 |
| Project | 25 |
| Exam 1 | 20 |
| Exam 2 | 20 |
| Total | 100 |

**Project**

- As we progress through the semester, groups of 4 students will be formed to carry out a project using HF methods, ergonomic tools, and/or software.
- Different topics will be suggested by the professor, and students will be allowed to work on their own ideas **after** receiving **approval** from the professor.
- Various milestones will be set up to ensure the project's deliverables meet expectations.
- The final deliverables are a scientific report modeled after the HFES annual meeting template and a presentation.

**Late Submissions/Penalty**

As future engineers, it is critical to learn to be prompt and take responsibility for assigned deadlines. All assignments will be due at 9 am morning on the day they're scheduled for. Late assignments will be penalized 20% for each day they are delayed and will not be accepted more than 3 days past the deadline.

**Grade Checking Policy**

Discussing solutions takes plenty of time in class and will not be given primary focus after a homework/exam/quiz. Solutions will only be mentioned at a high level in class, therefore any student wanting to check their grade should schedule a time to meet or come during office hours within 10 business days of the grades being released at the latest.

**Exams**

Exams will be open notes. This means you can print out slides or bring your notes from class. However, no laptops or phones will be allowed.

**Makeup policy**

University-approved excuses with tangible evidence should be discussed with me on a case-by-case basis to address any missed assignments/exams. You are responsible for informing me of any significant issues that come up at your earliest and no later than 1 week after the missed deadline.

**Attendance Policy**

Class attendance and participation are the student's responsibility. Students are expected to attend every class and complete all assignments. Graded in-class exercises/pop quizzes and bonus points may be given in class at any time throughout the semester.

**Accommodation for Disability**

AUB strives to make learning experiences accessible for all. If you anticipate or experience academic barriers due to a disability (such as ADHD, learning difficulties, mental health conditions, or chronic or temporary medical conditions), please do not hesitate to inform the

Accessible Education Office. To ensure that you receive the support you need and to facilitate a smooth accommodations process, you must register with the Accessible Education Office (AEO) as soon as possible: accessibility2@aub.edu.lb; +961-1-350000, x3168; West Hall, 304.