

INFO-B626 – Human Factors Engineering for Health Informatics

Course Information	3 Credit Hours Room: IT 167 Wednesday 6:00pm – 8:40pm
Instructor	Jung, Hee Tae
Office	IT 475F
Email	heetjung@iu.edu
Office Hours	By appointment
Class Organization	Lecture and Workshop
Prerequisites	INFO-I501 (Introduction to Informatics): Students are expected to be competent in processing health-related data and building machine learning models in Python. Python programming, basic statistical analysis, and machine learning algorithms are not taught in this course. INFO-B535 (Clinical Information Systems): Students are expected to have preliminary level of familiarity of health-related support systems, such as patient monitoring and EHR systems.

COURSE DESCRIPTION

This course serves as a comprehensive introduction to human factors that need to be considered when designing, implementing, using health informatics systems, and analyzing the health-related data. Throughout the semester, we will use conventional and sensor-based assessment approaches in select health informatics applications. The course will involve in-class quizzes, an in-class midterm, hands-on assignments, one project proposal. Programming will be involved in hands-on assignments. Students are allowed to use one of the three programming languages based on their preference: Python, R, and MATLAB. Students are assumed to have access to personal computers for the course.

TEXTBOOKS AND OTHER MATERIALS

All the necessary course materials (e.g., lecture slides, published papers) will be posted on Canvas. The list of books suggested below are optional, and students DO NOT need to purchase them. Note that the following list of books address a broad concept of human factors that may not pertain to health informatics. Motivated students are encouraged to study them to complement the course materials. The list will be updated throughout the semester.

- “**Advancing Diversity, Inclusion, and Social Justice Through Human Systems Engineering**” by Rod D. Roscoe, Erin K. Chiou, and Abigail R. Wooldridge, CRC Press, Taylor & Francis Group.
- “**The Design of Everyday Things**” by Don Norman, Basic Books.

COURSE SCHEDULE (Subject to change)

Week	Date	Class	Readings and Assessments
1/9 – 1/14	1/11	Lecture: Course overview, logistics, concept of health informatics, concept of human factors engineering	In-class quiz 1
1/16 – 1/20	1/18		In-class quiz 2

1/23 – 1/27	1/25	Lecture: Macrocognition, distributed cognition, expertise Workshop: Patient movement monitoring, Motor Activity Log (MAL), Fugl-Meyer Assessment (FMA), accelerometer sensors	In-class quiz 3
1/30 – 2/3	2/1		In-class quiz 4
2/6 – 2/10	2/8		Assignment 1 Due – Conventional data & Physical data
2/13 – 2/17	2/15	Lecture: Cognitive load Workshop: Engagement level, cognitive load, NASA-TLX, SUS, EEG Sensors	In-class quiz 5
2/20 – 2/24	2/22		In-class quiz 6
2/27 – 3/3	3/1		Assignment 2 Due – Conventional data & Neurophysiological data
3/6 – 3/10	3/8	Spring break, no class	N/A
3/13 – 3/17	3/15	Lecture: Age & impairments & roles, data & technology literacy Workshop: Personal health-related data from a smartwatch	In-class quiz 7
3/20 – 3/24	3/22		In-class quiz 8
3/27 – 3/31	3/29		Assignment 3 – Data processing and presentation for different users
4/3 – 4/7	4/5	Health Informatics solutions for daily living settings	In-class quiz 9
4/10 – 4/14	4/12		In-class quiz 10
4/17 – 4/21	4/19	Course review	Project Proposal Due
4/24 – 4/28	4/26	No class	In-class exam

ASSESSMENTS

In-class quizzes	40%
Assignment 1. Conventional data and physical data	10%
Assignment 2. Conventional data and neurophysiological data	10%
Assignment 3. Data processing for visualization and integration	10%
Project proposal	10%
Exam	20%
Total	100%

LATE ASSIGNMENT DEADLINES & POLICIES

Basics

Assignments should be done by a group of 3 unless inevitable.

Late Assignments

All assignments have due dates. Late assignments will receive a 5% reduction per day on the graded score of those assignments. For instance, if your assignment is late for 3 days, you will receive 85% of the graded score of the assignment. Assignments late for 6 or more days will receive a 30% reduction in total. For instance, if your assignment is late for 10 days, you will still receive 70% of the graded score of the assignment.

GRADING SCALES

A+	97 – 100	Outstanding achievement, given at the instructor’s discretion
A	93 – 100	Excellent achievement
A–	90 – 92.99	Very good performance and quality of work
B+	87 – 89.99	Good performance and quality of work
B	83 – 86.99	Modestly acceptable performance and quality of work
B–	80 – 82.99	Marginal acceptable performance and quality of work
C+	77 – 79.99	Unacceptable work (Core course must be repeated for credit)
C	73 – 76.99	Unacceptable work (Core course must be repeated for credit)
C–	70 – 72.99	Unacceptable work (Course must be repeated for credit)
D+	67 – 69.99	Unacceptable work (Course must be repeated for credit)
D	63 – 66.99	Unacceptable work (Course must be repeated for credit)
D–	60 – 62.99	Unacceptable work (Course must be repeated for credit)
F	Below 60	Unacceptable work (Course must be repeated for credit)

IUPUI CAMPUS POLICIES (last updated on 12/28/2023)

Adaptive Education Services

In compliance with the Americans with Disabilities Act (ADA), all qualified students enrolled in this course are entitled to reasonable accommodations. Please notify the instructor during the first week of class of accommodations needed for the course. Students requiring accommodations because of a disability must register with Adaptive Educational Services (AES) and complete the appropriate AES-issued before receiving accommodations. The AES office is located at UC 100, Taylor Hall (Email: aes@iupui.edu, Tel. 317 274-3241). Visit <http://aes.iupui.edu> for more information.

Religious Observance

According to the IUPUI Policy on Religious Holidays, any student who is unable to participate in any examination, study, or work requirement on some particular day or days because of his or her religious beliefs will be given the opportunity to make up the work. Requests for accommodation for religious observance must be made in writing and returned to the instructor by the end of the second week of the semester. Use the following link to generate a written form.

- <https://studentcentral.iupui.edu/calendars/holidays/course-accommodation-form.html>

Upon the submission of the request, you will receive a confirmation email. Your request is complete only when you provide instructor with the confirmation email, and you and the instructor reach a consensus on a reasonable accommodation.