



SUBJECT DATASHEET

Software ergonomics and product-user interaction

BMEGT52AT24

I. SUBJECT DESCRIPTION

1. SUBJECT DATA

Subject name

Software ergonomics and product-user interaction

ID (subject code) BMEGT52AT24

Type of subject

contact lessons

Course types and lessons

<i>Type</i>	<i>Lessons</i>
Lecture	1
Practice	2
Laboratory	1

Type of assessment

mid-term
grade

Number of credits

5

Subject Coordinator

<i>Name</i>	<i>Position</i>	<i>Contact details</i>
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Educational organisational unit for the subject

Department of Ergonomics and Psychology

Subject website

<https://edu.gtk.bme.hu>

Language of the subject

magyar - HU

Curricular role of the subject, recommended number of terms

Programme: **BSc in Industrial Design Engineering**
Subject Role: **Compulsory elective**
Recommended semester: **4**

Direct prerequisites

<i>Strong</i>	Ergonómia a gyakorlatban (BMEGT52AT21)
<i>Weak</i>	None
<i>Parallel</i>	None
<i>Exclusion</i>	None

Validity of the Subject Description

Approved by the Faculty Board of Faculty of Economic and Social Sciences, Decree No: 5881478/13/2024 registration number. Valid from: 11.12.2024.

2. OBJECTIVES AND LEARNING OUTCOMES

Objectives

The aim of the course is for industrial design engineer students to use their knowledge of ergonomics in relation to software user interfaces, to get an overview of the specific methods required for this, and to learn about the approach to interaction design.

Academic results

Knowledge

1. They have comprehensive knowledge of software ergonomic design guidelines.
2. They have knowledge of the psychological, cognitive, and physiological background of certain software ergonomic design guidelines.
3. They know approaches to the concept of usability and usability factors.
4. They have comprehensive knowledge of the set of methods of software ergonomics, primarily the methods of concept creation and testing, as well as usability tests.
5. They know the basic approach of interaction design and user experience design.

Skills

1. They are able to create multi-level concepts (sketch, wireframe, mockup) of software user interfaces or websites and use them for concept testing (paper prototyping).
2. They are capable of ergonomic testing of software user interfaces or websites using both analytical and empirical methods.
3. They are able to plan, conduct and evaluate information ergonomics experiments and empirical tests.

Attitude

1. They cooperate with the instructor and fellow students during the expansion of knowledge.
2. They expand his knowledge through continuous knowledge acquisition.
3. They are open to the use of new methods and new information technology tools.
4. They follow a user-centered approach.

Independence and responsibility

1. In some situations - as part of a team -, they cooperate with fellow students in solving tasks.
2. They adapt their independent work to their work in the group.
3. They accept well-founded critical comments with an open mind.
4. They responsibly communicate the user-centered and human-centered approach to others.

Teaching methodology

Lectures, exercises, laboratory exercises, assignments prepared independently or in group work

Materials supporting learning

- Herendy Csilla, Hercegfői Károly, Szabó Bálint, Tóvölgyi Sarolta, 2024, UX kutatási módszerek: A felhasználói élmény kutatása során alkalmazható gyakorlati módszerek, tudományos háttérük és összefüggéseik. Budapest: Edge 2000 Kiadó.
<http://hdl.handle.net/10890/57645>
- Alan Cooper, 2014, About Face: The Essentials of Interaction Design, 4th Edition, Wiley
- Caldwell, B. – Cooper, M. – Reid, L.G. – Vanderheiden, G. (eds.), 2008, Web akadálymentesítési útmutató 2.0a. W3C.
<http://www.w3c.hu/forditasok/WCAG20/>
- Krug, Steve, 2008, Ne törd a fejem! Budapest: HVG Kiadó.
- Shneiderman, Ben, et. al. 2016, Designing the User Interface, 6th Edition, Pearson.
- Weinschenk, Susan, 2011, 100 dolog amit minden tervezőnek tudnia kell az emberekről. Budapest: Kiskapu.

II. SUBJECT REQUIREMENTS

TESTING AND ASSESSMENT OF LEARNING PERFORMANCE

General Rules

A 2.2. pontban megfogalmazott tanulási eredmények értékelése két évközi írásbeli teljesítménymérés (összegző tanulmányi teljesítményértékelés), és egy csoportmunkában vagy egyénileg elkészített házi feladat alapján történik.

Performance assessment methods

Összegző tanulmányi teljesítményértékelés (ZH) és részteljesítmény értékelés (házi feladat).

Percentage of performance assessments, conducted during the study period, within the rating

- zárthelyi dolgozat: 25
- egyéni vagy csoportos házi feladat: 75

Percentage of exam elements within the rating

Conditions for obtaining a signature, validity of the signature

Issuing grades

Excellent	90
Very good	80-89
Good	70-79
Satisfactory	60-69
Pass	40-59
Fail	0-39

Retake and late completion

A zárthelyi dolgozat pótolható vagy javítható a szorgalmi időszak utolsó hetében tartott pótzH-n, továbbá pótolható a pótlási héten tartott pótpótzH-n is. A házi feladat pótolható a pótlási időszak utolsó napjáig.

Coursework required for the completion of the subject

Részvétel az előadásokon, gyakorlatokon és laborgyakorlatokon	56
Felkészülés az összegző teljesítményértékelésre	30
Házi feladat készítése	64
Összesen	150

Approval and validity of subject requirements

Consulted with the Faculty Student Representative Committee, approved by the Vice Dean for Education, valid from: 04.11.2024.

III. COURSE CURRICULUM

THEMATIC UNITS AND FURTHER DETAILS

Topics covered during the term

- 1 User experience (UX), interaction design and boundaries. Foundations of user-centered design. The importance of the user profile. Persona exercise.
- 2 Design guidelines 1: Weber-Fechner and Stevens' sensation functions. Applying Fitts' Law to the user interface. Motion enhancement, contrast enhancement, guidelines resulting from the human characteristics of color perception (complementary colors). Color fidelity and color spaces. Selection options for beginners and experienced users. Hick's law. Mental models. Metaphors of user interfaces. Desktop metaphor.
- 3 General design guidelines, Shneiderman's golden rules. Standards. W3C.org Accessibility Guidelines (WAI WCAG). Platform-specific principles (style guides). Microinteractions.
- 4 Obtaining information from potential users: observation, interview, focus group, questionnaire, design-ethnography, Q sorting, etc.
- 5 Basics of concept and prototyping: sketching, wireframing, prototyping. Concept testing in a low-fidelity way: paper prototyping. Rapid prototyper tools – Figma exercise.
- 6 Design patterns.
- 7 Information architecture, card sorting.
- 8 User journey, customer journey map.
- 9 Overview of design methods: A/B testing. GOMS model. Storyboarding methods. Concept testing in high fidelity: Wizard of Oz.
- 10 Analytical methods of software usability evaluation. Cognitive walkthrough exercise. Nielsen's heuristic analysis exercise.
- 11 Empirical methods of software usability evaluation: Usability testing based on screen recording, event logging and video analysis. Analysis of objective event data (e.g., key and mouse actions). Analysis of log files. Think Aloud protocol and Retrospective Think Aloud protocol. Eye tracking exercise. Mental effort and its measurement. Application of physiological signals (heart rate variability, pupillometry, skin conductance). A complex empirical research method: INTERFACE.
- 12 UX in industrial practice.

Additional lecturers

Herendy Csilla	tudományos munkatárs	herendy.csilla@gtk.bme.hu
Szabó Bálint	adjunktus	szabo.balint@gtk.bme.hu
Molnár Marietta	PhD hallgató	marietta.molnar@edu.bme.hu
Németh Ádám	megbízott oktató	nemeth.adam@gtk.bme.hu

Approval and validity of subject requirements