# SUBJECT DATASHEET

## Ergonomics - Human-centered design

## BMEGT52BX4T000-00

# I. SUBJECT DESCRIPTION

## 1. SUBJECT DATA

**Subject name**
Ergonomics - Human-centered design

**ID (subject code)** BMEGT52BX4T000-00

**Type of subject**
contact lessons

**Course types and lessons**

| *Type* | *Lessons* |
|---|---|
| Lecture | 2 |
| Practice | 0 |
| Laboratory | 0 |

**Type of assessment**
midterm grade

**Number of credits**
3

**Subject Coordinator**

| *Name* | *Position* | *Contact details* |
|---|---|---|
| Dr. Pataki-Bittó Fruzsina | senior lecturer | pataki.bitto.fruzsina@gtk.bme.hu |

**Educational organisational unit for the subject**
Department of Ergonomics and Psychology

**Subject website**

**Language of the subject**
magyar - HU

**Curricular role of the subject, recommended number of terms**

**Direct prerequisites**

| | |
|---|---|
| ***Strong*** | None |
| ***Weak*** | None |
| ***Parallel*** | None |
| ***Exclusion*** | None |

**Validity of the Subject Description**
Approved by the Faculty Board of Faculty of Economic and Social Sciences, Decree No: 580501/3/2025 registration number. Valid from: 2025.07.10.

# 2. OBJECTIVES AND LEARNING OUTCOMES

**Objectives**

The aim of the course is to introduce the fundamental principles of ergonomics and raise students' awareness of the role of human factors in engineering design. Students will learn how products and the physical environment influence efficiency, safety, and well-being.

**Academic results**

Knowledge

1. • Understands the basic concepts and main areas of ergonomics (physical, cognitive, and organizational ergonomics).
2. • Recognizes the role of human factors in product design and environmental development.
3. • Gains knowledge of general ergonomic requirements for products.
4. • Learns about the functioning of the human body, sensory perception, and information processing, and how these affect design.
5. • Understands the basics of anthropometric sizing and assessment.
6. • Becomes familiar with ergonomic evaluation methods (e.g., work posture assessment, usability testing).

Skills

1. • Can identify poorly designed work environments, tools, or systems from an ergonomic perspective.
2. • Is able to integrate human-centered considerations into engineering decisions and designs.
3. • Can apply basic ergonomic assessment and evaluation tools to practical examples.
4. • Moves beyond purely technical approaches to develop interdisciplinary, systems-level thinking.

Attitude

1. • Openness to user perspectives during the engineering design process.
2. • Sensitivity to human needs, particularly in relation to safety, comfort, and well-being.
3. • Development of social responsibility: students understand that their design decisions affect the working conditions and quality of life of others.

Independence and responsibility

1. Able to independently integrate user perspectives into engineering design work
2. Able to independently evaluate the ergonomics of products

**Teaching methodology**

Lectures with interactive elements and practical examples, individual problem-solving tasks, and optional assignments for deepening knowledge.

**Materials supporting learning**

- Hercegfi K., Izsó L. (szerk.) (2007): Ergonómia. Typotex, Budapest.
- Szabó Gy. (szerk.): Tervezés speciális felhasználói körök számára. DSGI kiadó Budapest 2002
- William H. Cushman, Daniel J. Rosenberg: Human Factors in Product Design. Elsevier, 1991
- Daams, B. J. (1994): Human Force Exertion in User-product Interaction. TU Delft.
- Pheasant, S (1988): Bodyspace. Taylor & Francis.
- Sanders, M. S., McCormick, E. J. (1993): Human Factors in Engineering and Design. McGraw-Hill, London.

# II. SUBJECT REQUIREMENTS

## TESTING AND ASSESSMENT OF LEARNING PERFORMANCE

**General Rules**

To obtain the midterm grade, students are required to submit an individual assignment by the specified deadline. In addition, there are optional opportunities to earn extra points through voluntary tasks and a written test.

**Performance assessment methods**

Partial Performance Assessment (Individual Assignment): This assessment method provides a complex evaluation of the subject's knowledge-,
skill-, and attitude-based competency elements. It takes the form of an individually prepared assignment. The content, requirements, submission deadline, and evaluation criteria of the assignment are determined by the instructor. Partial Performance Assessment (Optional
Tasks): Students may choose from optional tasks scheduled throughout the semester, such as voluntary assignments or a written tes

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

- **házi feladat**: 60
- **választható feladatok**: 40
- **összesen**: 100

**Percentage of exam elements within the rating**

**Conditions for obtaining a signature, validity of the signature**

A tárgy teljesítésének feltétele, hogy a házi feladatra kapható pontszám min. 40%-át, valamint az összesen szerezhető pontszám min. 40%-át érje el a hallgató.

**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 házi feladat pótlással a pótlási időszak utolsó napján elektronikus formában 23:59-ig adható be, heti 5% (max. 20%) pontlevonással. A választható részteljesítmény értékelések közül a zárthelyi dolgozat pótolható a pótlási héten.

**Coursework required for the completion of the subject**

| | |
|---|---|
| részvétel kontaktórán | 28 |
| írásos anyag elsajátítása a részteljesítmény értékelésekhez | 30 |
| 1. részteljesítmény értékelés (házi feladat) | 20 |
| 2. részteljesítmény értékelés (választható) | 12 |
| összesen | 90 |

**Approval and validity of subject requirements**

Consulted with the Faculty Student Representative Committee, approved by the Vice Dean for Education, valid from: 07.07.2024.

# III. COURSE CURRICULUM

## THEMATIC UNITS AND FURTHER DETAILS

**Topics covered during the term**

A témák az ergonómia elméleti alapjait , majd gyakorlati példákon át az ergonómia különböző területeinek alkalmazását mutatja be.

1 Bevezetés az ergonómiába, az ergonómia területei
2 Az emberközpontú tervezés folyamata és módszerei
3 Design for All/Univerzális tervezés
4 Antropometria és méretezés
5 Biomechanika és testhelyzetek értékelése
6 Környezeti tényezők: világítás, zaj, hőmérséklet hatásai
7 Munkakörnyezet tervezés ergonómiája
8 Információ ergonómia
9 Használhatóság, kognitív ergonómia
10 Kényelem és felhasználói élmény
11 Aktuális témák az ergonómiában

**Additional lecturers**

| | | |
|---|---|---|
| Dr. Pulay Márk | adjunktus | pulay.mark@gtk.bme.hu |
| Dr. Hercegfi Károly | docens | hercegfi.karoly@gtk.bme.hu |

**Approval and validity of subject requirements**