SUBJECT DATASHEET

PSEUDOSCIENCE AND SCIENCE (MSc)

BMEGT41M301

I. SUBJECT DESCRIPTION

1. SUBJECT DATA

Subject name
PSEUDOSCIENCE AND SCIENCE (MSc)

ID (subject code)	BMEGT41M301

Type of subject
contact lessons

Course types and lessons

Type	*Lessons*
Lecture	3
Practice	0
Laboratory	0

Type of assessment
seminar grade

Number of credits
3

Subject Coordinator

Name	*Position*	*Contact details*
Dr. Héder Mihály	associate professor	heder.mihaly@gtk.bme.hu

Educational organisational unit for the subject
Department of Philosophy and History of Science

Subject website
https://www.filozofia.bme.hu/targyak

Language of the subject
magyar - HU, angol - EN

Curricular role of the subject, recommended number of terms
Programme: **Engineering Manager Msc from 2018/19/Term 1 (Autumn term start)**
Subject Role: **Compulsory elective**
Recommended semester: **1**

Programme: **Engineering Manager Msc from 2017/18//term 2 (Spring term start)**
Subject Role: **Compulsory elective**
Recommended semester: **1**

Direct prerequisites

Strong	None
Weak	None
Parallel	None
Exclusion	Tudomány, tudományellenesség, áltudomány (BMEGT41A028), Áltudomány és Tudomány (BMEGT41V104)

Validity of the Subject Description
Approved by the Faculty Board of Faculty of Economic and Social Sciences, Decree No: 580768/11/2022. Valid from: 26.10.2022.

2. OBJECTIVES AND LEARNING OUTCOMES

Objectives

The aim of the course is to develop a reflective and conscious view about the distinction between science and pseudoscience. In addition to describing the most important theoretical traditions, the course also places a strong emphasis on examining practical issues that arise in everyday life. In an era when the authority of science is being challenged or exploited by newer and newer trends (see e.g. antivaccination, intelligent design), an important goal of university education is to develop methodological awareness and prepare students for developing articulated opinions on scientific and technological questions concerning society. Therefore, in addition to the problem of pseudosciences and demarcation, the course examines the difference between reliable and unreliable forms of knowledge, the relationship between science, education, society and the media, and the problem of expertise.

Academic results

Knowledge

1. Knows the similarities and differences between science and pseudoscience, and their methodological bases.
2. Knows the connections between science, education, society and the media, the different manifestations of this relationship and their consequences.
3. Knows the broader system of her field, recognizes the relationships with related disciplines, uses the opportunities provided by the wider system and the contexts related to the system.
4. Possesses adequate and sufficient knowledge to orient herself in the various mechanisms of social decision-making.

Skills

1. Confidently uses the vocabulary and the basic scientific concepts of the profession, and the elements of the special vocabulary based on them.
2. Possesses the ability to gain a new perspective, she is able to approach science and its environment with an interdisciplinary approach.
3. In solving her professional tasks, she is able to independently analyze, evaluate, and synthesize conclusions and explanations.
4. She is able to apply a wide range of well-established techniques for the critical analysis and processing of information.
5. She is able to participate in the process of lifelong learning.
6. Identifies special professional problems with an interdisciplinary approach, explores and articulates the detailed theoretical and practical background needed to solve them.
7. Using the learned theories and methods, she explores, systematizes and analyzes facts and basic connections, formulates independent conclusions, critical remarks, and decision-making proposals, and makes decisions in routine and partly unknown - domestic and international - environments.

Attitude

1. Accepts and consistently embraces the diversity of social scientific thinking and credibly represents its conceptual foundations in her narrower and wider environment.
2. Open to critical self-reflection, various forms of professional development, self-improvement methods of intellectual worldview and strives for self-development in these areas.
3. Possesses a problem-centric perspective and problem-solving thinking.

Independence and responsibility

1. In her own professional environment, she develops a historically and politically coherent individual position, which helps the development of herself and her environment.
2. She is independent, constructive and assertive in forms of cooperation inside and outside the institution.
3. Carries out her work independently with a critical evaluation and continuous correction of her activity.
4. Participates responsibly in the development and justification of her professional views.
5. Responsible for her analyzes, conclusions and decisions.

Teaching methodology

Lectures

Materials supporting learning

- Tankönyvek - Textbooks
- 1. Beck Mihály (2004): Parajelenségek és paratudományok. Budapest: Vince Kiadó.
- 2. Bunge, Mario A. (1982): Demarcating Science from Pseudo-Science. In Fundamenta Scientiae 3: 369–388.
- 3. Gordon, Michael C. (2021). On the Fringe: Where Science Meets Pseudoscience. Oxford: Oxford University Press.
- 4. Grim, Patrick. (1982): Philosophy of Science and the Occult. Albany: State University of New York Press.
- 5. Krekó Péter – Falyuna Nóra (2022). Sarlatánok kora – Miért dőlünk be az áltudományoknak. Budapest: Athenaeum Kiadó.
- 6. Kutrovátz Gábor – Láng Benedek – Zemplén Gábor: A tudomány határai. Budapest: Typotex, 2008.
- 7. Kutrovátz Gábor – Láng Benedek – Zemplén Gábor (szerk.): „Tudományon innen és túl”. Tematikus blokk a Replika c. folyóiratban 54–55. szám (2006), 119-205. o. (Lásd Kutrovátz–Láng–Zemplén, Vermeir, Shapin, Gieryn, Gregory–Miller cikkeit.)
- 8. McGrath, Alister (2012). Tudomány és vallás. Budapest: Typotex.
- 9. Shermer, Michael (2001): Hogyan hiszünk. Istenkeresés a tudomány korában. Budapest: Typotex.
- Jegyzetek, letölthető anyagok - Downloadable materials

- 1. A tárgyhoz kapcsolódó jegyzet és a bemutatott slide-ok. / Lecture notes and PPT-slides.

II. SUBJECT REQUIREMENTS

TESTING AND ASSESSMENT OF LEARNING PERFORMANCE

General Rules

A 2.2. pontban megfogalmazott tanulási eredmények értékelése: kettő évközi írásbeli teljesítménymérés és az aktív órai részvétel alapján (opcionális) történik.

Performance assessment methods

1. General course assesment: a complex, written assessment of the subject material, knowledge and abilities. The thesis focuses on knowledge elements, interpretation, and conclusion in the form of a written exam. Working time 30-60 minutes depending on the material.
At least 50% of the maximum points must be achieved in each exams to complete the subject. 2. Partial knowledge assessment (project):
based on the learnt theoretical and practical knowledge, prepare an assignment individually that is worth one credit. 3. Partial knowledge assessment (class participation): a simplified evaluation method for the student's knowledge, skills, attitudes, autonomy and responsibility
elements. The evaluation modes are determined by the subject supervisor and the subject lecturer.

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

- **general course assessment**: 35
- **general course assessment**: 35
- **partial knowledge assessment (project)**: 30
- **partial knowledge assessment (active participation) - optional**: 10

Percentage of exam elements within the rating

Conditions for obtaining a signature, validity of the signature

Issuing grades

Excellent	84
Very good	85-90
Good	70-84
Satisfactory	55-69
Pass	40-54
Fail	0-39

Retake and late completion

Only one general course assessment can be retaken free of charge during the retake period. In case of the retake-exam, the result achieved
on the retake-exam will be taken into account.

Coursework required for the completion of the subject

participation in contact hours	28
preparation for general course assessment	32
preparation of the project	30

Approval and validity of subject requirements

Consulted with the Faculty Student Representative Committee, approved by the Vice Dean for Education, valid from: 10.10.2022.

III. COURSE CURRICULUM

THEMATIC UNITS AND FURTHER DETAILS

Topics covered during the term

1. Introduction. The problem of sciences and pseudosciences in our everyday life. Course requirements. Discussion. 2. Philosophy of science and its attempts to separate science from pseudoscience. 3. The history of science as a separation in time, the change of boundaries
over time. 4. Case study 1. Astronomy and astrology in the past and today. Returning to the question of the scientific method. 5. Case study 2. Parapsychology, parasciences. The problem of content separation, boundary drawing strategies. 6. Case study 3. The problem of alternative prehistory. The problem of expertise. 7. Case study 4. Evolution and creationism. Scientology. The relationships between religion and science. 8. Case study 5. Traditions of alternative medicine. Acupuncture, homeopathy. Social and cultural authority. Placebo effect 9. Boundary-works in Science. Controversies at the frontiers of science. 10. Boundary drawing experiments using the sociology of science. 11. Public understanding of science. The role of education and the media. Is alienation a scientific or a social problem?

Additional lecturers

Dr. Bíró Gábor István	egyetemi adjunktus/assistant professor	biro.gabor@gtk.bme.hu
Dr. Kutrovátz Gábor	egyetemi docens/associate professor	kutrovatz.gabor@gtk.bme.hu
Petschner Anna	egyetemi tanársegéd/assistant lecturer	petschner.anna@gtk.bme.hu

Approval and validity of subject requirements