COURSE DESCRIPTION CARD - SYLLABUS

Course name
SUSTAINABLE DEVELOPMENT IN TECHNICAL SCIENCES [S5SD1>ZRNT]

Course

Proposed by Discipline
–

Year/Semester
1/2

Level of study
Doctoral School

Course offered in
English

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
4

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

dr inż. Marlena Kucz prof. PP
marlena.kucz@put.poznan.pl

Lecturers

Prerequisites

Knowledge Basic knowledge of technical sciences and engineering.General understanding of environmental issues and contemporary economic challenges. Skills: Ability to analyze scientific literature in Polish and English. Social comptences: Readiness for interdisciplinary work and critical evaluation of technical solutions in terms of their social and environmental impact.

Course objective

The objective of the module “Sustainable Development in Technical Sciences” is to deepen doctoral students’ knowledge and enhance their competencies in the principles of sustainable development, as well as their ability to apply these principles in conducting scientific research and developing technological innovations. The module is aimed at educating conscious researchers and future leaders in the scientific community who are capable of integrating technological advancement with social and environmental responsibility, while addressing the challenges of the contemporary knowledge-based economy, the low-emission economy, and the circular economy.

Course-related learning outcomes

Knowledge:
- Student acquires knowledge of global challenges and sustainable development, covering theoretical foundations as well as general and selected specific issues relevant to integrating sustainable development

principles into technical research and innovation P8S_WG/SzD_W01
- The student is familiar with key developmental trends in scientific research and technological innovation and is able to assess their significance for implementing sustainable development principles P8S_WG/SzD_W02]
- A PhDl student knows and understands: economic, legal, ethical and other vital conditions related to scientific activity related to sustainable development [P8S_WK/SzD_W05]

Skills:
A doctoral student can:
- communicate on specialist issues on the level that allows active participation in - the international scientific community [P8S_UK/SzD_U04],
- initiate debates, [P8S_UK/SzD_U06]

Social comptencences:
A PhD student who graduated from doctoral school is ready to:
- critically assess achievements within a given scientific discipline [P8S_KK/SzD_K01],
- initiate actions in the public interests [P8S_K0/SzD_K05],
- acknowledge the importance of knowledge in solving cognitive and practical problems [P8S_KK/ SzD_K03]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Active participation in class (discussions, group work, debate) (50%)
Presentation of problem analysis (20%)
Written reflection (brief, e.g., 1–2 paragraphs) on the role of sustainable development in scientific research and technological innovation (30%)

Programme content

Introduction to Sustainable Development in Technical Sciences
Global Challenges and Sustainable Development Goals (UN Agenda 2030)
Ethics and Social Responsibility in Technical Sciences
Methods for Assessing the Impact of Technology on the Environment and Society

Course topics

Introduction to Sustainable Development in Technical Sciences
Environmental, Social, and Economic Aspects
Assessment Methods and Interdisciplinary Approaches Selectred" “Six Thinking Hats” method – analysis of a selected technical problem or short debate

Teaching methods

Multimedia presentations using illustrations and examples.
Selected methods: e.g. moderated discussions and debates, the “Six Thinking Hats” method (E. de Bono) supporting a multi-perspective approach to problem analysis. Group work and interdisciplinary analysis.

Bibliography

1. Brundtland G., “Our Common Future”, 1987 – classic definition and concept of sustainable development.
2. Sustainable Development Goals and the Agenda2030 link https://ec.europa.eu/commission/presscorner/detail/en/memo_15_5709 or https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf
3. “Sustainability” in higher education: From doublethink and newspeak to critical thinking and meaningful learning, link https://www.researchgate.net/publication/237152910

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	4	0,00
Doctoral student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation)	21	1,00