COURSE DESCRIPTION CARD - SYLLABUS

Course name
Zastosowania techniczne izotopów promieniotwórczych

Course

Field of study
Technologia chemiczna (Chemical Technology)
Year/Semester
IV/8
Area of study (specialization)
-
Profile of study
general academic
Level of study
First-cycle studies
Course offered in
Polish
Form of study
part-time
Requirements
elective

Number of hours

Lecture
20
Laboratory classes
0
Other (e.g. online)
0
Tutorials
0
Projects/seminars
0

Number of credit points

1

Lecturers

Responsible for the course/lecturer:
dr inż. Aleksandra Grząbka-Zasadzińska
Responsible for the course/lecturer:

Prerequisites

Knowledge of issues related to the basics of nuclear physics. Knowledge of the structure of the atom, atomic nucleus.

Ability to obtain information from literature, databases, other properly selected sources.

Understanding the need for training and improving one's professional competences and the significance of the effects of engineering activities.

Course objective

Acquiring knowledge on the possibility of using radioactive isotopes and the basics of radiological protection.

Course-related learning outcomes

Knowledge

K_W02 has the necessary knowledge of physics to understand the theory, phenomena and physical processes

K_W03 has the necessary knowledge of chemistry to understand chemical phenomena and processes

K_W06 knows the necessary principles of operation of control and measurement systems and electronic control systems used in chemical technology

K_W09 has the necessary knowledge of both natural and synthetic raw materials, products and processes used in chemical technology, as well as the directions of development of the chemical industry in the country and in the world

Skills

K_U01 can obtain information from literature, databases and other sources related to closed-loop technologies, also in a foreign language, integrate them, interpret them, draw conclusions and formulate opinions

K_U04 has the ability to self-educate, can use source information in Polish and a foreign language in accordance with the principles of ethics, reads with understanding, conducts analyzes, syntheses, summaries, critical assessments and correct conclusions

K_U10 has the preparation and competences necessary to work in an industrial environment and knows the rules of occupational health and safety

K_U25 assesses the risks associated with the use of chemical products and processes

Social competences

K_K02 is aware of the importance and understanding of non-technical aspects and effects of engineering activities, including its impact on the environment and the related responsibility for decisions

K_K07 is aware of the social role of a technical university graduate, and especially understands the need to formulate and convey to the society, in particular through the mass media, information and opinions on the achievements of science and other aspects of engineering activities; makes efforts to provide such information and opinions in a generally comprehensible manner

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

1. Rating of written exam

Programme content

The interaction of ionizing radiation with matter (alpha, beta, gamma and neutron radiation).

Radioactive elements in nature.

The law of radioactive disintegration. Radioactive series.

Types of natural radioactive disintegration.

Elements of radiometry. Gas, scintillation, and semiconductor detectors.

Fundamentals of radiological protection. The concept of ionizing radiation doses.

Working with ionizing radiation sources. Risks related to working with ionizing radiation sources.

Radioactive contamination and radioactive waste.

The use of alpha, beta, gamma, and neutron radiation in specific technical and technological problems.

Teaching methods

Lectures

Bibliography

Basic

1. W. Gorączko, Radiological protection, Poznań University of Technology, Poznań, 2011

2. W. Gorączko, Elements of nuclear chemistry, Poznań University of Technology, Poznań 2012

3. W. Gorączko, Radiochemistry and radiological protection, Poznań University of Technology, Poznań, 2003

4. B. Dziunikowski, The use of radioactive isotopes, AGH, Kraków, 1995

Additional

1. A. Hrynkiewicz, Man and ionizing radiation, PWN, Warsaw, 2001

Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,0
Classes requiring direct contact with the teacher	20	0,7
Student's own work (literature studies, preparation for tests/exams) [1]	10	0,3

[1] delete or add other activities as appropriate