COURSE DESCRIPTION CARD - SYLLABUS

Course name

Radiation protection

Course

Field of study	Year/Semester
Technical Physics	3/6
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	15	
Tutorials	Projects/seminars	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr inż. Robert Hertmanowski

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Wydział Inżynierii Materiałowej i Fizyki Technicznej

Responsible for the course/lecturer:

Prerequisites

Basic knowledge of physics and chemistry. Knowledge of the structure of the atom, the atomic nucleus, and the basics of mathematical statistics. The ability to solve simple physical problems based on the acquired knowledge, the ability to obtain information from the indicated sources.

Course objective

1. Understanding the theoretical and problematic problems with accessing protocol isotopes and basic ionizing procedures related to legal processes related to radiological protection and the method of gaining access to solving technical issues. Presentation of problems related to the risk assessment of work with radioactive substances.

2. Understanding the measurements of quantities characterized by ionization.

3. Development in students.

Course-related learning outcomes

Knowledge

1. has available documentation on a topic in the field of radiology [1_W03]

2. Basic principles of isotope measurements [K1_W09]

4. knows necessary to understand environmental engineering, technical knowledge, law and other technical issues [conditions and physics of the scientific environment] [K1_W16]

Skills

1. manages to successfully print and print engineering print in a language with well-documented and interpreted results [K1_U04]

3. analytical and computational tool management tool, creating analytical and technical tools; can critically evaluate the results of such an analysis [K1_U09]

4. can and then select the scheme of its analysis and/or the physics of the technical solution of the problem

5. can choose the properties of physicochemical and structural properties to materials, materials, and engineering [1_U18]

6. Technical messages and solving technical tasks to handle their social, economic, and legal aspects [K1_U23]

Social competences

1. can work independently and responsibly in a team on a given task [K1_K01]

2. is aware of and understands the importance of non-technical aspects and effects of engineering activities, including its impact on the environment and the related responsibility for decisions made [K1_K06]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Effect. Form of evaluation. Assessment criteria

W01, W02, W03 Assessment of individual oral responses, protocols 50.1% -70.0% (3)

and a written microproject 70.1% -90.0% (4)

from 90.1% (5)

U01, U02 Assessment of individual oral responses 50.1% -70.0% (3)

and a written microproject 70.1% -90.0% (4)

from 90.1% (5)

K01 Assessment of individual oral responses 50.1% -70.0% (3)

and a written microproject 70.1% -90.0% (4)

from 90.1% (5)

Programme content

1. Radioactive decay, ionizing radiation, detection of ionizing radiation, the interaction of radiation with matter, absorption of radiation, and the interaction of radiation on living matter. Laboratory, industrial and medical applications of ionizing radiation sources. Measurement and calculation of ionizing radiation doses, calculation of shields. Basics of international and Polish atomic law.

2. Laboratory exercises are a practical illustration of the lecture material in the field of radioactivity, radiation detection, spectral analysis, the interaction of radiation with matter, doses, shields, and elements of the atomic law.

Teaching methods

Form of classes:

Lecture illustrated with diagrams, animations, and photos.

Isotope laboratory.

Bibliography

Basic

1. J. Sobkowski: Chemia jądrowa, PWN 1981

2. W. Szymański: Chemia jądrowa, PWN 1996

3. S. Magas: Technika izotopowa, WPP 1994

4. W. Gorączko: Radiochemia i ochrona radiologiczna. WPP 2003

5. J. Sobkowski, M. Jelińska-Kazimierczuk: Chemia Jądrowa. Wydawnictwo Adamantan 2006.

Additional

1. M. Bryszewska i inni: Biofizyka dla biologów, PWN 1997

2. W. Scharf: Akceleratory biomedyczne, PWN 1994

3. Bezpieczeństwo jądrowe i ochrona radiologiczna - Prawo Atomowe, przepisy wykonawcze i przepisy związane, Warszawa 1991

4. PN-69/J-80001: Materiały i sprzęt ochronny przed promieniowaniem X i gama (Obliczanie osłon stałych).

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	45	2,0

[1] delete or add other activities as appropriate