COURSE DESCRIPTION CARD - SYLLABUS

Course name
Fundamentals of radiation protection

Course

Field of study
Technical Physics

Year/Semester
3/6

Area of study (specialization)

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
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. Zbigniew Górski e-mail

zbigniew.gorski@gmail.com

tel.61665265

Faculty of Chemical Technology

Berdychowo, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Student should know basic chemistry and physics course curriculum for Technical Physics students. Student's knowledge and abilities should provide solving easy physical problems and do research from sources.

Course objective

Getting knowledge about the theoretical and practical problems related to the use of radioactive isotopes and ionizing radiation, the rules and standards related to radiological protection and the basic legal regulations related to the use of ionizing radiation sources. Learning the principles of measuring the quantities characterizing ionizing radiation. Developing ability to solve engineering problems and prepare projects.

Course-related learning outcomes

Knowledge

Result of the coirse will be:

1. Having knowledge of physical phenomena in the field of radiation protection [K1_W03]

2. Having knowledge of the rules of engineering graphics and technical drawing [K1_W06]

3. Having knowledge of the basic principles of isotope measurements [K1_W09]

4.Having knowledge necessary to understand social, economic, legal and other non-technical determinants of engineering activity, including radiological protection and environmental physics [K1_W16]

Skills

As a result of the course, the student will acquire the following skills:

1. Can, on the basis of the literature, independently make a preliminary analysis of a construction problem and draw conclusions [K1_U01, K1_U02]

2. Can prepare independently and legibly prepare documentation of an engineering project in Polish with well-documented and interpreted calculation results [K1_U04]

3. Is able to correctly use standard analytical and computational tools to solve detailed physical and technical problems; is able to critically evaluate the results of such an analysis [K1_U09]

4. Can identify a technical problem and then propose a diagram of its analysis and / or solution, detailing its essential physicochemical aspects [K1_U14]

5. Can select materials with appropriate physicochemical and design properties for laboratory and engineering applications [K1_U18]

6. Can, when formulating and solving engineering tasks, see their social, economic and legal aspects [K1_U23]

Social competences

As a result of the conducted classes, the student will acquire the following social competences:

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

2. Is aware 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:

Efeect	Form of assessment	Criteria of assessment

W01, W02, W03	Assessment of individual oral responses, protocols and a written microproject	50.1%-70.0% (3) 70.1%-90.0% (4) 90.1% and more (5)
U01, U02	Assessment of individual oral responses, protocols and a written microproject	50.1%-70.0% (3) 70.1%-90.0% (4) 90.1% and more (5)
K01	Assessment of individual oral responses and a written microproject	50.1%-70.0% (3) 70.1%-90.0% (4) 90.1% and more (5)

Programme content

1. Radioactive decay, ionizing radiation, detection of ionizing radiation, interaction of radiation with matter, absorption of radiation, 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. Fundamentals of international and Polish atomic law.

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

Teaching methods

1. Lecture illustrated with diagrams, animations and photos. Isotope laboratory.

2. Individually performed micro-project in the field of isotope application in technology.

3. Internet discussion group of the subject (por_z_z_gorskim@googlegroups.com).

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	70	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