Title	Code
Radiochemistry and radiation protection	**101070531101071742**
Field: **Environmental Protection Technologies**	Year / Semester: **1 / 1**
Specialty	Course: **core**
Hours: Lectures: **20** Classes: Laboratory: **20** Projects / seminars:	Number of credits: **5**

Lecturer:

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Status of the course in the study program:

Radiochemistry and radiation protection
Obligatory course (core)

Objectives of the course:

Basic knowledge in radiation chemistry and radiochemistry, application of radiochemical methods in controlling of typical chemical processes, radiometric methods of measurements, radiation protection, ionising radiation influence on biological objects and environment.

Course description:

1. Basic elements of nuclear physics - nucleus parameters and models of nuclear force, types of ionising radiation and its effects on the matter, natural and artificial radioactive elements, nuclear reactions.
2. Elements of radiation chemistry and radiochemistry - radioisotope element's obtaining methods, "hot atoms" chemistry, isotope effect, isotope exchange reactions, radiotracer method, radiolysis phenomena, neutron activation analysis.
3. Radiometry - gamma, beta, alfa and neutron measurements techniques, basic monitors and dozymeters.
4. Basic elements of radiation protection - radioactive sources, dose and dose rate of ionising radiation, ionising radiation shields, radioactive contamination and decontamination procedures, radioactive waste and its utilisation, health and safety precautions, radiation hormesis phenomena, basic radiation protection rules (working out some mathematical problems concerning protection from radiation hazards of workers).
5. Application review of radioactive elements and ionising radiation in techniques, medicine, agriculture, science and environmental science, nuclear energy production.

Initial knowledge:

Basic course of physics, chemistry and mathematics.

Teaching methods:

Lectures and laboratory. The lecture as a multimedial presentation.

Assessment methods:

Written examination and constant spoken control in laboratory training.

Bibliography:

1. Radiochemia i ochrona radiologiczna, W.Gorączko, Politechnika Poznańska, Poznań, 2003
2. Chemia jądrowa, J.Sobkowiak, PWN, Warszawa, 1990
3. Chemia jądrowa, W.Szymański, PWN, Warszawa, 1999
4. Człowiek i promieniowanie jonizujące, A.Hrynkiewicz, PWN, Warszawa, 2001
5. Elementy nauki o promieniowaniu jądrowym dla kierunków ochrony środowiska, W.Szymański, UMK, Toruń,, 1999
6. Technika izotopowa, S.Magas, Politechnika Poznańska, Poznań, 1994
7. Radiochemia, A.Niesmiejanow, PWN, Warszawa, 1995
8. Zastosowanie izotopów promieniotwórczych, B.Dziunikowski, AGH, Kraków, 1995
9. Nuclear chemistry, A.Vertes, I.Kiss, Akademia Kiado, Budapest, 1987
10. Chemia radiacyjna, J.Kroh, PWN, Warszawa, 1995
11. Principles of radiochemistry, H.Kay, Butterworths, London, 1985