|  |  |  |  |
| --- | --- | --- | --- |
| **Course title**  Nuclear chemistry – ERASMUS  Chemia jądrowa - ERASMUS | | | **ECTS code**  13.3.1276 |
| **Name of unit administrating study**  Faculty Chemistry | | | |
| **Studies**   |  |  |  |  | | --- | --- | --- | --- | | **Field of study** | **Type** | **Form** |  | | Chemistry | Bachelor | Full-time studies |  | | Chemistry | Master | Full-time studies |  | | Environmental sciences | Bachelor | Full-time studies |  | | | | |
| **Teaching staff**  dr Grzegorz Olszewski; mgr Aleksandra Moniakowska | | | |
| **Forms of classes, the realization and number of hours** | | **ECTS credits 4**  classes 30 h  tutorial classes 20 h  student’s own work 50 h  TOTAL: 100 h - 4 ECTS | |
| 1. **Forms of classes, in accordance with the UG Rector’s regulations**   auditorium | |
| 1. **The realization of activities**   In-class or on-line | |
| 1. **Number of hours**   30 h - auditorium | |
| **The academic cycle**  winter | | | |
| **Type of course**  facultative | **Language of instruction**  English | | |
| **Teaching methods**  Seminar with multimedia presentation | **Form and method of assessment and basic criteria for evaluation or examination requirements** | | |
| **A. Final evaluation, in accordance with the UG study regulations**  course completion (with a grade) | | |
| **B. Assessment methods**  Writing test | | |
| **C. The basic criteria for evaluation** or exam requirements  Evaluation criteria in accordance with the UG Studies Regulations; | | |
| **Required courses and introductory requirements**  no requirements | | | |
| **Aims of education**  Acquaint the students with nuclear chemistry  **Convergent to:** general chemistry, inorganic chemistry, physical chemistry, analytical chemistry, instrumental analysis, environmental sciences | | | |
| **Course contents**  Elements of nuclear chemistry, atomic nucleus structure and elementary particles. Spontaneous nuclear transformations. Radioactive equilibrium. Theory of radionuclides decays. Natural and artificial radioactivity. Radioactive activity and its units. Radiometric methods in radiochemical analysis. Origin and occurrence of radioactive elements in nature. The use of radioactive elements in science, technology and medicine. Nuclear weapon. Nuclear reactions as a source of energy. Nuclear Power. Nuclear reactor and reactor processes. Disasters at Chernobyl and Fukushima nuclear plants | | | |
| **Bibliography of literature**  Any nuclear chemistry book | | | |
| **Knowledge**  1. knows and understands the basic concepts of nuclear chemistry and radiochemistry,  2. knows and understands the basic concepts related to the structure of the atomic nucleus and particles elementary and core processes  3. understands the types of nuclear reactions, nuclear transformations and methods radiometric used in the analysis of radioactive elements,  4. has knowledge of natural and artificial radioactive elements and their occurrence in nature,  5. has knowledge of radiation chemistry processes,  5. knows the concept of a radiation dose and distinguishes between its types and units,  6. has knowledge of the use of radionuclides in science, technology and medicine,  7. has knowledge about the construction of a nuclear reactor and knows the advantages and disadvantages related to the development of nuclear energy. | | | |
| **Skills**  1. recognizes and understands the basic concepts of nuclear chemistry and radiochemistry,  2. understands the theories of the structure of matter and the synthesis of chemical elements,  3. recognizes the most important natural and artificial radionuclides found in nature,  4.understands the basic processes of radiation chemistry,  5. can comment on nuclear energy,  6. is aware of the importance of natural and artificial radioactivity in life human,  7. is aware of the importance and applications of radioactive substances in science, technology and medicine  8. can calculate the activity of radioactive isotopes and the size of doses radiation. | | | |
| **Social competence**  1. understands the need for further education in the field of nuclear chemistry and radiochemistry,  2. it addresses social concerns related to the use of substances radioactive in science, industry and medicine,  3. makes the society aware of the impact of radioactivity on human life,  4. presents the ways of using radioactive substances in human activity,  5. actively participates in making the society aware of energy nuclear,  6. shows creativity in the use of radioactive isotopes in life and human development | | | |