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| **Course title**Biofuels – ERASMUS Biopaliwa – ERASMUS  | **ECTS code**13.3.1346 |
| **Name of unit administrating study** Faculty Chemistry |
| **Studies**

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| **Field of study** | **Type** | **Form** |  |
| Chemistry | Bachelor  | Full-time studies  |  |
| Chemistry | Master | Full-time studies |  |
| Environmental sciences | Bachelor | Full-time studies |  |

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| **Teaching staff**prof. dr hab. Ewa Siedlecka |
| **Forms of classes, the realization and number of hours**  | **ECTS credits 2**classes 15 htutorial classes 10 hstudent’s own work 25 hTOTAL: 50 h - 2 ECTS |
| 1. **Forms of classes, in accordance with the UG Rector’s regulations**

seminar |
| 1. **The realization of activities**

In-class or on-line |
| 1. **Number of hours**

15 h - seminar |
| **The academic cycle**summer |
| **Type of course**facultative | **Language of instruction**English |
| **Teaching methods**Lecture 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**Familiarizing students with all issues listed in the seminar program content**Convergent to**: general chemistry, analytical chemistry, environmental sciences |
| **Course contents**Characteristics of renewable energy sources. Determinants of energy policy in the 21st century and forecasts for the future. Legislation regarding energy and bioenergetics in Poland. Biomass energy resources. Energy crops as a raw material for the production of energy and liquid and gaseous biofuels. Characteristics of gas biofuels. Characteristics of liquid biofuels. Work parameters and operation. Biofuel production technology. Utilization and management of waste generated during production. Selected examples of energy recovery technology.  |
| **Bibliography of literature** Pandey A., Handbook of plant-based biofuels, CRC Press Taylor &Francis Group, 2009 |
| **Knowledge**1. discusses the energy situation of the country and the world2. lists and defines the basic types of unconventional energy3. lists and characterizes the basic types of biofuels4. lists and characterizes the use of biofuels5. classifies raw materials and appropriate technologies for the production of biofuels6. applies the basic technological terms describing the biofuel production process,7. discusses the advantages and disadvantages of the production and use of biofuels. |
| **Skills**1. follows established research procedures2. recognizes laboratory equipment and uses it to conduct chemical experiments,3. presents the correct one clearly both in speech and in writing chemical and technological reasoning, 4. performs the analysis of the selected parameter based on the procedure5. speaks about chemical and technological issues in an understandable language6. plans and conducts easy and medium difficult chemical experiments and technological, |
| **Social competence**1. understands the need to save energy2. understands the need for further education,3. shows creativity in independent and team work4. is careful when handling chemicals.5. is open to suggestions from the leader and colleagues from the group6. complies with the arrangements agreed with the teacher7. demonstrates responsibility for the proper conduct of the experiment |