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| **Course title**Composite materials and polymers – ERASMUS Materiały i kompozyty polimerowe – ERASMUS  | **ECTS code**13.3.1257 |
| **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 |
| **Course contents**Reactions and polymerization methods, polymer properties, thermoplastic polymers (PE, PP, PVC, polyamides, polycarbonates, polyurethanes), thermosets (chemo and thermosetting resins), elastomers, foamed polymers, natural polymers (cellulose and its derivatives, rubber, starch, and others), Self-healing polymer materials, the use of nanomaterials in polymer composites, polymer composites - laminates, bulletproof composites, nanotubes and carbon fibers; special purpose polymers - graphene, Kevlar, intelligent polymers, polymer nanomaterials, dental materials, materials used in medicine and cosmetics, artificial skin, hydrogels, polymers conductive, dendrimers. |
| **Bibliography of literature** Materials used during the seminar. |
| **Knowledge*** 1. Classifies polymers and composites
	2. Lists the parameters characterizing polymers and composites
	3. Lists the polymerization reactions
	4. Characterizes selected production technologies of polymers and composites
	5. Discusses selected applications of polymers (in medicine, pharmacy, packaging, construction, automotive, etc.)
	6. Lists and characterizes the most important polymers and composites
	7. Defines concepts related to the types and synthesis of polymers and composites
	8. Discusses the advantages and disadvantages of individual polymers and composites - the problem of microplastics is solved
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| **Skills*** 1. follows established research procedures
	2. recognizes laboratory equipment and uses it to carry out chemical experiments,
	3. performs the analysis of the selected parameter based on the procedure
	4. speaks about chemical and technological issues in an understandable language
	5. plans and conducts easy and medium difficult chemical experiments and technological,
	6. predicts, verifies and criticizes the results of the conducted activities experiments
	7. independently searches for information in the literature
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| **Social competence**1. understands the need to search for new materials and nanomaterials
2. understands the need for further education,
3. shows creativity in independent and team work
4. is careful when handling substances chemical.
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