

Course title: Technology of novel polymeric materials – ~~selectable~~/ regular course

Number of contact hours: 30 hours (15h lectures, 15h laboratories)

ETCS credits: 2

Course description: This course allows the students to understand basic laws in polymer chemistry and physics as well as the effect of chemical structure of polymers and used additives on the materials properties. Firstly, a general introduction to polymers, basic terminology and definitions, their current classification and applications will be presented. In the second part of course selected types of modern polymeric materials will be presented and basic structure-property relationships will be discussed including explanation of the reasons of specific characteristics of analyzed materials. Novel technology and processing of polymeric materials including bio-based polymers and nanocomposites will be discussed in the context of their special applications.

Education effects (P7S_UW, P7S_WG):

- **knowledge:** students have the basic knowledge in the frame of: polymers chemistry and technology, selected novel methods of polymer synthesis and processing, characterizing of polymers and relationships between polymer structure and properties, adjusting of polymeric materials for specific applications.

- **skills:** students are able to synthesize various types of polymeric materials including porous and nanomaterials as well as to characterize them using the specific apparatus,

- **social:** students are able to work independently and to co-operate in the group.

Literature: [1] Manas Chanda — Introduction to Polymer Science and Chemistry: A Problem-Solving Approach, CRC Press 2013, [2] Iannace S., Park C.B. (editors) — Biofoams – Science and Applications of Bio-Based Cellular and Porous Materials, CRC Press, 2016. [3] Cowie J.M.G., Arrighi V.: Polymers: Chemistry and Physics of Modern Materials, CRC Press, 2008.

Assessment method: Final test, completing the laboratories (presence and delivering of reports from each performed exercise)

Prerequisites: No prerequisites.

Primary target group: All specialties students

Lecturer: Aleksander Prociak, Ph.D., D.Sc., Eng.,

Contact person: Aleksander Prociak, Ph.D., D.Sc., Eng., tel. +48 12 628 30 16, email: aprociak@pk.edu.pl