

Course title:	Thermoplastic Composites
Institute/Division:	Institute of Material Science, Faculty of Material Science and Physics
Course code:	
Erasmus subject code:	Material Science
Number of contact hours:	45 hours
Course duration:	1 semester
ECTS credits:	6
Course description:	

This course is an introduction to polymer composites for undergraduate students in Material Science, Mechanical Engineering or Chemical Engineering with no previous knowledge of the subject.

The subject includes a review of thermoplastic polymer materials and composites made on their matrix. Issues include a review of the physico-mechanical properties of polymers and composites, testing of performance and basic theories of reinforcement of short-fiber and microparticles composites. The types of fibers and fillers, methods of improving adhesion and issues related to the compatibility of polymer mixtures will also be presented. The technologies for the compounding of mixtures and technologies for the manufacture of thermoplastic polymer composites will be discussed. In the end, the methods of their utilization and recycling as well as the impact on the environment will be presented.

Literature:

- S.Kuciel, P. Kuźniar, Polymeric material, Politechnika Krakowska 2015
M.F. Ashby, Material and the Environment, Elsevier 2009
A.K. Mohanty, M. Misra, L.T. Drzal, Natural Fibers, Biopolymers and Biocomposites, Taylor&Francis 2005
R.A. Malloy, Plastic Part Design for Injection Molding, Hanser 2011.

Course type:	lectures (30 hours), problem sessions (15 hours)
Assessment method:	two tests during the semester, final exam
Prerequisites:	at least one college level math course
Primary target group:	Majors in Material Science, Mechanical Engineering, Chemical Engineering
Lecturer:	Stanisław Kuciel, PhD Msc Prof. PK
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