

Course Description

Title: Ceramics vs. Polymers: Dawn of materials

Fields of activity: Chemical Engineering, Chemistry/Chemical Technology, Civil Engineering, Environmental Engineering, Food Engineering, Materials Engineering

Examination type: Written exam

Number of ECTS credits issued: 1

Learning Goals and Objective: The aim of the course is to enable students to gain knowledge in types, properties and uses of products from biodegradable materials. At the same time the students will have been able to explain the mechanism of polymer degradation and describe the benefits of using biodegradable polymeric materials.

Also they will learn the traditional and modern methods for synthesis and processing of ceramics, the photocatalysis of TiO_2 for the protection of the cultural heritage

Pre-materials

For books/articles:

Name	Polymer Chemistry, Seventh Edition
Topic/field	Polymer Chemistry
Chapter/Section (for books)	Chapter 1 - Introduction to Polymers Chapter 2 - Polymer Structure (morphology)
Short description (optional)	The book provides important subjects of polymer science and technology http://www.crcnetbase.com/isbn/978-1-4200-5102-5
Professor/Author	Seymour/Carraher
References (optional)	G. Bogoeva-Gaceva, M. Avella, M. Malinconico, A. Buzarovska at al. "Natural Fiber Eco-composites" Polymer composites 28(1) 98-107 (2007)

Name	Ceramic Materials Science and Engineering
Topic/field	Ceramics Chemistry
Chapter/Section (for books)	pages: 3-13; 345-357, 359-362; 400-411, 412-425, 427-443
Short description (optional)	The book provides important subjects for the type of ceramics, their properties and usage. https://books.google.mk/books?id=aE_VQ8I24OoC&printsec=frontcover&redir_esc=y#v=onepage&q&f=false
Professor/Author	C. Barry Carter, M. Grant Norton
References (optional)	

Name	Synthesis of nanocomposite coating based on TiO ₂ /ZnAl layer double hydroxides, Materiales de Construcción 67(325):112, 2017
Topic/field	Ceramics Chemistry
Chapter/Section (for books)	The whole book
Short description (optional)	The students will get familiar with the self-cleaning property of TiO ₂
Professor/Author	V.Jovanov, O.Rudic, J.Ranogajec, E.Fidanchevska
References (optional)	

Name	Ceramics products from waste
Topic/field	Ceramics Chemistry
Chapter/Section (for books)	The whole book
Short description (optional)	The book provides information about industrial wastes (fly ash and bottom ash) as potential raw materials for fabrication ceramics products. https://www.intechopen.com/books/ceramic-materials
Professor/Author	A.Zimmer
References (optional)	

Name	The materials science of thin films
Topic/field	Polymer Chemistry
Chapter/Section (for books)	Chapter 13 – Modification of surfaces and films
Short description (optional)	The book provides important subjects for the thin film science and technology
Professor/Author	Milton Ohring
References (optional)	<ol style="list-style-type: none"> 1. A. Yariv, <i>Optical Electronics</i>, 3rd ed., Holt, Rhinehart and Winston, New York (1985). 2. C. W. Draper and J. M. Poate, <i>Znt. Met. Rev.</i> 30, 85 (1985). 3. N. Bloembergen, in <i>Laser-Solid Interactions and Laser Processing</i>, eds. S. D. Ferris, H. J. Leamy, and J. M. Poate, Amer. Inst. of Physics, No. 50 (1979). 4. A. E. Bell, <i>RCA Rev.</i> 40, 295 (1979). 5. L. E. Greenwald, E. M. Breinan, and B. H. Kear, in <i>Laser-Solid Interactions and Laser Processing</i>, e&. S. D. Ferris, H. J. Leamy, and J. M. Poate, Amer. Inst. of Physics, No. 50 (1979).