



UNIVERSITY OF CHEMICAL TECHNOLOGY AND METALLURGY
FACULTY OF METALLURGY AND MATERIALS SCIENCE
CENTRE OF MATERIALS SCIENCE

Approved:
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Dean, Faculty of Metallurgy and Materials Science

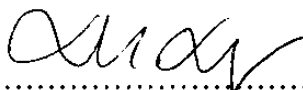
Master Course MATERIALS SCIENCE AND ENGINEERING

SYLLABUS

ENGINEERING POLYMER MATERIALS

Specialty: Materials Science

Degree of Qualification: Master of Materials Science and Engineering

Centre of Materials Science:


Prof. Donka Angelova
Centre Head

Sofia 2007

Engineering Polymer Materials

Aims

To develop further the ideas of preparation and characterization of organic and inorganic polymers encountered in I and II Semesters, using the concept of engineering design of these materials and its application to a wide range of cases. To illustrate strategies and to describe in details the way of changing of engineering polymer and their everyday application like polymeric details, coatings and adhesives.

General description

This discipline covers the properties of materials and their tailoring to technological problems in particular polymeric materials.

Syllabus content

1. Introduction to the major achievements and milestones in engineering polymer materials - 1 h.
2. Stereo specific polymers, high molecular polyethylene and polyethylene oxide - 1 h.
3. Polymers with high physic-mechanical properties - 2 h.
4. Fiberglass and organic fiber composites - 3 h.
5. Thermostabile and flame retardant polymers - 1 h.
6. Polymer alloys - 1 h.
7. Polymer lattices and their applications - 1 h.
8. Elastomers with high and special characteristics - 2 h.
9. Polymers in textile and shoe industry - 1 h.
10. Polymers in high energetic materials, propellants and explosives - 1 h.
11. Polymeric plasticizers for cement - 1 h.
12. Polymers in paper industry - 1 h.
13. Coatings: design, preparation, characterization: hygienic, intelligent coatings - 2 h.
14. Adhesives for different materials and applications - 2 h.

Practical work

1. Preparation and characterization of samples from blends of high molecular polyethylene and polypropylene - 4 h.
2. Crosslinking of thermo stabile epoxy resin with acid anhydrides and determination of thermostability of the obtained samples by DTA and TG analyses - 4 h.
3. Obtaining of flame resistant polyester - 2 h.
4. Preparation of acrylic lattices with nano particle sizes or core - shell particles - 6 h.
5. Preparation of vulkanizates - 4 h.
6. Preparation and characterization of samples from fiberglass and organic fiber composites - 8 h.
7. Investigation of 3 polymeric plasticizers for gypsum-free cement - 4 h.

8. Determination of the surface of paper, coated with polymeric additives - 4 h.
9. Preparation and determination of water stability of adhesives for wood - 4 h.

12.06.2006

Sofia,

Autor: .....

(Prof. DrSci. Ivan Glavchev)