
COURSE: SCIENCE of POLYMER SCIENCE

ACADEMIC YEAR: 2016-2017

TYPE OF EDUCATIONAL ACTIVITY: Free choice (Basic, Characterizing, Affine, Free choice, Other)

TEACHER: Prof. Vincenzo Villani

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website:

phone: 0971205464

mobile (optional):

Language: Italian

ECTS: (lessons e
tutorials/practice)

n. of hours: (lessons e
tutorials/practice)

Campus: Potenza
Department of Science
Program: CHIMICA (L27)

Semester: II
(expected dates:
06/03/2017,
15/06/2017)

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

Knowledge: fundamentals of strength and rheology of materials with respect to structural and viscoelastic properties of polymers.

Ability: evaluate the applicative characteristics of the polymeric materials and their processing conditions.

PRE-REQUIREMENTS

Fundamentals of Macromolecular Chemistry.

SYLLABUS

Young's law

Axial stresses and stress-strain plot of polymer materials

Polymer toughness

Poisson's coefficient

Bending deformation of natural or synthetic polymers

Shear stress

Torsion deformation

General state of stress

Fracture mechanics

Newtonian or non-newtonian fluids

Rheopectic or thixotropic behaviours

Dynamic-mechanical analysis of polymers

Creep and stress-relaxation experiments

Maxwell and Kelvin-Voigt viscoelastic models

Rheological behaviour and models of polymeric liquids

Polymer composites

Processing of polymer materials

TEACHING METHODS

Theoretical lessons.

EVALUATION METHODS

Intermediate verifications or oral examination.

The exam is divided into 3 parts that take place during the course; the test consists of 4 tracks open to play in 2 hours.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

Villani Vincenzo, *Introduzione alla Scienza dei Materiali Polimerici*, Aracne Editrice

Bruckner et al., *Scienza e tecnologia dei Materiali Polimerici*, EdISES

INTERACTION WITH STUDENTS

Office hours: Monday, Wednesday and Friday from 11 to 17 in the studio or in lab of Macromolecular Chemistry.
Moreover, the teacher is available on his e-mail.

EXAMINATION SESSIONS (FORECAST)

24/02/2017, 31/03/2017, 28/04/2017, 26/05/2017, 30/06/2017, 28/07/2017, 29/09/2017, 27/10/2017,
24/11/2017, 15/12/2017, 26/01/2018

SEMINARS BY EXTERNAL EXPERTS YES NO
