



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Chemistry and Technology of Polymers and Industrial Applications

1819-1-F5302Q009

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#### Aims

The aim of the course is to highlight the applications of a few classes of polymers, and both up-to-date scientific methods and technological processes to improve their properties.

#### Contents

The course encompasses advanced technological processes in the synthesis and transformation of polymers, including new methods of polymer synthesis, introduction to hybrid materials and nanochemistry with particular emphasis to preparation and characterization of polymer materials endowed with heterogeneous interfaces and new functional properties.

#### Detailed program

Advanced technological processes in the synthesis and transformation of polymers with the final aim to improve their functional properties.

New synthetic methods for the preparation of 3D porous polymers.

Introduction to hybrid materials and applications of nanostructured materials, such as modified clays and porous

materials, to polymers for improving mechanical and optical properties. Particular attention will be paid to nanocomposites, elastomers for the automotive industry and polymers for electronic applications.

Additives for better microadhesion at the heterogeneous interfaces.

Characterization of the extended interfaces by advanced methods.

The impact of nanochemistry on advanced polymeric materials for optical and structural applications.

The course includes seminars by experts in the field of polymer chemistry and will be integrated by visits to polymer companies of the area.

The student is requested to propose a subject of his interest in the field to be presented to the class.

## **Prerequisites**

- Basic knowledge of macromolecular chemistry.

## **Teaching form**

Lectures , seminars and industrial applications.

## **Textbook and teaching resource**

1) Hybrid Materials: Synthesis, Characterization, and Applications. Editor: [G. Kickelbick](#). Wiley-VCH (2007). ISBN: 978-3-527-31299-3

2) Nanochemistry A Chemical Approach to Nanomaterials. Authors: G. A. Ozin, A. Arseanault and L. Cadermartiri. RSC Publishing (2009). ISBN 978-1-84755-895-4

3) Lecture Notes.

## **Semester**

1st year, 2nd semester.

## **Assessment method**

Evaluation of the acquired knowledge during the course and presentation of a chosen topic in the field of materials chemistry and technology.

## **Office hours**

Tuesday morning at 10:30.

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