



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Physical Chemistry of Solid State and Surfaces

1819-1-F5302Q011

---

#### Aims

Joining fundamental concepts of the solid state and surface physical chemistry with applicative issues in the science and technology of semiconductors.

#### Contents

Importance of defects on material properties, mainly in semiconductors. Elements of physical chemistry of surfaces. Adsorption phenomena: physisorption and chemisorption. Principal methods and techniques of Surface Characterization. Growth techniques of massive materials and thin film deposition procedures. Correlation of properties, defects and growth techniques

#### Detailed program

Defects in solids: Point and extended defects (dislocations, grain boundaries, antiphase domains, stacking fault) and their interactions. Elements of surface crystallography. Surface relaxation and reconstruction in vacuum. Adsorption phenomena: physisorption and chemisorption. Principal methods and techniques of Surface Characterization (SEM, XPS, AUGER, SIMS). Growth techniques of massive materials. General aspects of thin film deposition procedures and main thin film deposition techniques. General aspects of thin film deposition procedures.

## **Prerequisites**

Main Physical Chemistry I and Materials Science topics in 1st cycle bachelor degree programs

## **Teaching form**

Lectures in the classroom

## **Textbook and teaching resource**

S. Eliot The Physics and Chemistry of solids Wiley

J. D. Plummer , M.D. Deal, P.B. Griffin Silicon VLSI Technology Prentice Hall

Sergio Pizzini Physical Chemistry of Semiconductor Materials and Processes Wiley

Surface science an introduction J. b. Hudson

All these books are available in the UNIMIB library

## **Semester**

First year, Second ( spring ) semester

## **Assessment method**

The teacher assesses if and to what extent the student has reached the course objectives.

A formal knowledge-based evaluation of the general topics delivered. The examination is performed through an oral exam .

The students can do a mid term test: a class presentation of about 15 minutes on a topic selected by the students from a list that the teacher will give at about the end of March of each year. This presentation will count

for 30 % of your final grade

## **Office hours**

All days from Monday to Friday upon e-mail request

---