UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

# Dental Materials

**2425-2-H4601D011**

## Aims

The aim of the course is to learn about the science of biomaterials from the chemical composition to the physical-mechanical characteristics and the different applications in the practice of dentistry.

## Contents

Science and technology of dental materials. Recall on matter: composition, structure and state of aggregation. Equilibrium states. Adhesion and Cohesion.
General properties: biological, physical and technological-commodity properties.
Metals: solidification and structure, deformation, hardening, recrystallization and grain growth.
Alloys: constitution and reaction in the solid state. Thermal treatments. Corrosion.
Alloys for amalgams and their structure. Dental amalgams: dimensional variations, resistance, creep (Gold for direct fillings).
Dental cements: classification, composition and structure.
Synthetic polymers: composite materials Enamel-dentin adhesive systems.
Polymerization techniques.
Endodontic materials. Ni-Ti alloys.
Noble metal alloys for casting, non-noble metal alloys for casting, semi-finished noble and base metal alloys. The steels.
Coatings: classification, structure and composition. Solder me and welding procedures.
Gypsum materials: model plasters, impression plasters.
The waxes.
Dental ceramics: classification and their structure.
Synthetic polymers: resins for prosthetics.
Rigid impression materials: thermoplastic pastes, plasters, zinc oxide-eugenol pastes.
Elastic impression materials: irreversible hydrocolloids, reversible hydrocolloids, elastomers.

## Detailed program

Applications in dental materials: biocompatibility of dental materials, the physical properties of dental materials, chemical properties. Morphology and classification of teeth: structure and morphology of teeth, signs of histochemistry of teeth, physical and mechanical properties of teeth; classification identification of teeth. Gypsum for dental use: chemical and physical characteristics, handling and properties; applications. Waxes for dental use: the characteristics of wax modeling, composition and properties of waxes; application in dentistry: Covers and refractory materials: types of coating materials and their characteristics; bond acidic materials, materials in phosphate binder, gypsum-bonded materials : Gold and gold alloys: structure and properties of alloys, gold alloys for prosthetic devices. Basic metals and alloy steel: composition, physical and mechanical properties; mergers resin and porcelain. Ceramic materials for dentistry: dental ceramics, and chemical and physical characteristics, classific

## Prerequisites

The goals of the previous courses

## Teaching form

Lessons: in-person delivery method.
Within the single lesson, didactic and interactive teaching will be carried out
30 hours of didactic teaching and 10 hours of interactive teaching

## Textbook and teaching resource

Anastasia M. Calderai G. Materiali dentari. Antonio Delfino Editore
Baldoni M. Elementi di clinica Odontoiatrica per il corso di laurea in Odontoiatria e Protesi Dentaria
Publications of the most recent literature relating to dental materials used in dentistry

## Semester

I semester

## Assessment method

The exam will be oral and will focus on the topics covered in class
The knowledge and skills acquired will be evaluated.
There are no ongoing tests

## Office hours

monday 8:30-9:30

## Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | PARTNERSHIPS FOR THE GOALS