

## Biomaterials

ECTS	Course (h)
3	18

<b>Mention du master transmettant la fiche UE :</b>	<b>Chimie et Sciences des Matériaux</b>
<b>Composante de gestion de l'UE :</b>	<b>Faculté des Sciences – Département de Chimie</b>
<b>Responsable de l'UE :</b>	<b>Thomas TRIMAILLE</b>
<b>Statut du responsable :</b>	<b>PR</b>

### **PRE REQUIS**

Basic knowledge in polymer and inorganic material chemistry

### **PROGRAMM**

1. General introduction – biomaterial concept

Definition, challenges, bio-ethical and regulatory aspects, material-tissue interactions biocompatibility, biofunctionality, biodegradability

2. The different classes of biomaterials

Polymers (synthetic, natural), hydrogels, metals and alloys, ceramics

3. Biomaterial properties

Mechanical properties, surface properties (physics/chemistry), degradation/stability (temporary/permanent implants),...

4. Tissue engineering

Concept, scaffold preparation, applications

5. Biomaterials - case study: hard tissues (bone, cartilage, dental)

orthopedic prosthesis, bone substitutes, dental prosthesis

### **SPECIFIC SKILLS**

- To know the challenges and requirements of biomaterials in health area
- To know the different classes of biomaterials, in link with the targeted application.
- To master the structure property relationships in context of biomaterials