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| 5.0 credits | 30.0 h + 30.0 h | 2q |
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| Teacher(s) :              | Leloup Gaëtane (coordinator) ; Demoustier Sophie ; Dupont Christine ;   |
| Language :                | Français  |
| Place of the course       | Louvain-la-Neuve  |
| Main themes :             | <p>Main themes</p> <p>The course is divided into 3 parts. The first part is a general introduction to the main classes of biomaterials: structure of natural and synthetic materials (polymers, ceramics and glasses, metals and composite materials); the second part approaches biomaterials properties: mechanic properties, surface properties compared with mass properties, physical and chemical properties, degradability. This part implies the study of the interactions between materials and living organisms: protein adsorption, cell adhesion, inflammation, immunitary reaction, coagulation,</p> <p>; the third part will include a range of selected application examples of the different classes of biomaterials in medicine, biology and artificial organs : cardiovascular biomaterials, orthopedic biomaterials, dental materials, materials specific to drug delivery, biosensors, tissues engineering,</p> |
| Aims :                    | <p>Aims</p> <p>Introductory course to biomaterials science.</p> <p>Upon completion of this course, the students will be able to:</p> <ol style="list-style-type: none"> <li>1. Describe the structure and properties of the different classes of biomaterials;</li> <li>2. Describe the principles driving the interactions between materials and living organisms;</li> <li>3. Justify the choice of a given biomaterial according to the function that it has to fulfill when exposed to a biological system or implanted into a human body.</li> </ol> <p><i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i></p>   |
| Content :                 | <p>Summary : contents and methods</p> <p>Part 1 : General introduction to the main classes of biomaterials</p> <ol style="list-style-type: none"> <li>1.1 Polymers</li> <li>1.2 Metals</li> <li>1.3 Ceramics</li> <li>1.4 Composite materials</li> <li>1.5. Hydrogels</li> <li>1.6. Natural materials</li> </ol> <p>Part 2 : Properties of biomaterials</p> <ol style="list-style-type: none"> <li>2.1. Mechanical properties</li> <li>2.2. Surface properties vs. mass properties</li> <li>2.3. Interaction biomaterials-living organisms</li> </ol> <p>Part 3 : Biomaterials Applications in medicine + selected examples</p> <p>Method :</p> <p>Theoretical course (30h) + Practical work (30h).</p>   |
| Other infos :             | <p>Other information (prerequisite, evaluation, course materials, recommended readings)</p> <p>Prerequisite: basic notions in chemistry, biochemistry, physics and materials science.</p>   |
| Cycle and year of study : | <p>&gt; <a href="#">Master [120] in Electro-mechanical Engineering</a></p> <p>&gt; <a href="#">Master [120] in Mechanical Engineering</a></p> <p>&gt; <a href="#">Master [120] in Biomedical Engineering</a></p> <p>&gt; <a href="#">Master [120] in Chemical and Materials Engineering</a></p> <p>&gt; <a href="#">Master [120] in Computer Science and Engineering</a></p> <p>&gt; <a href="#">Master [120] in Electrical Engineering</a></p> <p>&gt; <a href="#">Master [120] in Mathematical Engineering</a></p>  |

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| Faculty or entity in charge: | GBIO |
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