





5.00 credits

45.0 h

Q2

|                             |  |
|-----------------------------|--|
| Teacher(s)                  | Lefèvre Philippe ;   |
| Language :                  | French   |
| Place of the course         | Louvain-la-Neuve   |
| Prerequisites               | No prerequisites   |
| Main themes                 | <p>Biomedical engineering is a pluridisciplinary field that finds its place at the interface between biomedical sciences and engineering sciences leading on to a multitude of applications. Thus, biomedical engineering is not only an important discipline subject to specific teachings in a constantly increasing number of universities, but also a domain quite difficult to apprehend at first glance.</p> <p>Therefore the main objective of this course is to present to the students whose interests lay in biomedical engineering an introduction to the discipline. Concretely, this course covers an introduction to the main domains of biomedical engineering: (bio)-instrumentation, medical imaging, medical computer sciences, biological models, artificial organs, (bio)-materials, rehabilitation engineering, radiophysics, and clinical engineering.</p> |
| Learning outcomes           | <p><b>At the end of this learning unit, the student is able to :</b></p> <p>Regarding the learning outcomes of the program of "Master in Biomedical Engineering", this course contributes to the development and the acquisition of the following learning outcomes:</p> <p>AA1.1, AA1.2, AA1.3<br/>AA6.2</p> <p>1 <b>More precisely, at the end of this course, students will be able to:</b></p> <ul style="list-style-type: none"> <li>• understand, through a series of examples, the notions of (bio)instrumentation, (bio)material, artificial organs, medical imaging, clinical engineering, modelling of biological systems, etc. '.</li> <li>• later on, apply these concepts in order to solve elementary problems in the field of biomedical engineering</li> </ul>   |
| Evaluation methods          | Students will be individually evaluated (written and/or oral examination) on the learning outcomes detailed above.   |
| Teaching methods            | The course is made of lectures given by the teachers.  |
| Content                     | <p>The different fields of application of engineering to biomedical sciences will be presented in the course, with many examples of practical implementations. Among them:</p> <ul style="list-style-type: none"> <li>• Biomedical engineering : a historical perspective</li> <li>• Ethics in the field of biomedical engineering</li> <li>• Biomechanics (mechanical properties of biomaterials and applications)</li> <li>• Rehabilitation</li> <li>• Biomaterials</li> <li>• Tissue engineering</li> <li>• Bioinstrumentation</li> <li>• Biosensors</li> <li>• Biomedical signals processing</li> <li>• Mathematical modeling of physiological systems</li> <li>• Bioinformatics and genomics</li> <li>• Medical imaging</li> </ul>  |
| Inline resources            | Moodle<br><a href="https://moodleucl.uclouvain.be/course/search.php?search=LGBIO1112">https://moodleucl.uclouvain.be/course/search.php?search=LGBIO1112</a>  |
| Bibliography                | Les documents du cours sont disponibles sur iCampus.<br>"Introduction to Biomedical Engineering", Elsevier, disponible à la BST  |
| Faculty or entity in charge | GBIO   |

| <b>Programmes containing this learning unit (UE)</b> |                         |         |              |   |
|--|-------------------------|---------|--------------|---|
| Program title  | Acronym                 | Credits | Prerequisite | Learning outcomes   |
| Specialization track in Biomedical Engineering       | <a href="#">FILGBIO</a> | 5       |              |  |
| Master [120] in Chemistry and Bioindustries          | <a href="#">BIRC2M</a>  | 5       |              |  |
| Master [120] in Physics                              | <a href="#">PHYS2M</a>  | 5       |              |  |
| Mineure Polytechnique                                | <a href="#">MINPOLY</a> | 5       |              |  |