| MEDBIOT-E05: **APPLICATION OF TISSUE ENGINEERING IN CLINICAL PRAXIS** | |
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| **GENERAL INFORMATION** | |
| Course Coordinator(s) | Jure Mirat, MD, PhD, full prof. with tenure |
| Associate(s) | Ljubica Glavaš-Obrovac, PhD, full prof. with tenure<br>Teuta Opačak-Bernardi, PhD, assist. prof. |
| Study Programme | Interdisciplinary Graduate Study Programme in English: Biotechnology |
| Course Status | Elective |
| Year of Study, Semester | 2nd year / 4th Semester |
| Credits (ECTS) | **4** |
| Teaching Method (number of classes) | Lectures:15; Seminars: 30; Exercises: 0 |
| Expected Number of Students in the Course | 25-30 |
| **COURSE DESCRIPTION** | |
| **Course Aims** | |
| The aim of this study is to analyze the state of the art of Tissue Engineering and some of its application fields such are heart, vascular, bone, cartilage, and cancer. | |
| **Prerequisites for Enrolment and the Entry Competencies Required for the Course** | |
| Completed and passed courses from 1st year of the study. | |
| **Learning Outcomes at the Programme Level Contributed by the Course** | |
| BIOTECH-3; BIOTECH-6; BIOTECH-10; MEDBIOT-2; MEDBIOT-5 | |
| **Learning Outcomes at the Course Level** | |
| After completing the course, the student will be able to:<br>1. Assess the importance of tissue engineering and the achievements of regenerative medicine in the regeneration of damaged tissues.<br>2. Evaluate the physical and biochemical techniques available for the evaluation and development of tissue engineer and regenerative medicine products for clinical use.<br>3. Recommend method of bioengineering in tissue development.<br>4. Critically evaluate the results of the various studies available in the scientific and professional literature. | |
| **Course Content** | |
| **Lectures:** Tissue bioengineering. Types of tissue that can be regenerated. Regenerative medicine. Tissue engineering in the regeneration of damaged tissues. Tissue Engineering in Cardiology. Tissue Engineering of the Vascular System. Pancreatic tissue engineering. Tissue Engineering of Bone Tissue and Cartilage. Tissue Engineering in Modeling Human Physiology. Drug discovery.<br>**Seminars:** Tissue engineering in the regeneration of damaged tissues. Tissue Engineering in Cardiology. Tissue Engineering of the Vascular System. Pancreatic tissue engineering. Tissue Engineering of Bone Tissue and Cartilage. | |
| Teaching Methods | |
| Lectures; seminars; laboratory exercises | |
| Students' Obligations | |
| Attendance at all forms of classes is mandatory and the students are obligated to attend all knowledge tests. The students may be absent from 30% (full-time students) and 50% (part-time students) of each of the forms of classes, provided that the absence is justified. An exercise or a seminar which has not been completed must be made up through a midterm exam. | |
| **Monitoring the Activity of the Students *(Connecting Learning Outcomes, Teaching Methods, and Grading)*** | |

| Class-related activity | ECTS | Learning outcome | Student activity | Evaluation method | Grade points | |
|---|---|---|---|---|---|---|
| | | | | | Min. | Max. |
| Attending classes (lectures, seminars, exercises) | 1.6 | 1-4 | Attendance at classes<br>Seminar preparation and presentation | Keeping records<br>Presentation | 2<br>8 | 5<br>35 |
| Final exam | 2.4 | 1-4 | Studying for the final exam | Written exam | 40 | 60 |
| **Total** | **4** | | | | **50** | **100** |

*Evaluation of the written part of the final exam:*

| Percentage of correct answers (%) | Grade |
|---|---|
| >95.00 | 60 |
| 90.00-94.99 | 58 |
| 85.00-89.99 | 55 |
| 80.00-84.99 | 52 |
| 75.00-79.99 | 49 |
| 70.00-74.99 | 46 |
| 65.00-69.99 | 43 |
| 60.00-64.99 | 40 |

*Forming the final grade:*
The points granted for the final exam are added to the grade points awarded during class attendance. The grading process is conducted by absolute distribution, i.e. based on total achievements, and compared to the numerical system in the following manner:
A – Excellent (5): 90-100 grade points; B – Very Good (4): 80-89.99 grade points; C – Good (3): 65-79.99 grade points; D – sufficient (2): 50-64.99 grade points

| **Mandatory Literature (available in the library and via other media)** | | |
|---|---|---|
| Title | Number of copies in the library | Availability via other media |
| Blitterswijk CV, Boer JD: Tissue Engineering. 2nd Ed., 2014. | | Yes |
| Quan Wang: Smart Materials for Tissue Engineering: Applications. The Royal Society of Chemistry, 2017. | | Yes |
| **Additional Literature** | | |
| Scientific and professional papers related to individual chapters (available online. | | |
| **Quality Assurance Procedures Designed to Ensure the Acquisition of Outcomes and Competencies** | | |
| Anonymous, quantitative, standardized student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Medicine Osijek and/or the Faculty of Food Technology Osijek. | | |
| **Note** | | |
| E-learning is not included in the class quota, but it is used in teaching and it contains links to various sites and video and audio materials available on websites. | | |