| BIOMECHANICAL MODELS IN THE LOCOMOTOR SYSTEM | |
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| **GENERAL INFORMATION** | |
| Course coordinator | Professor Dario Faj, PhD |
| Assistant/Associate | Associate Professor Antonio Kokot, MD, PhD<br>Assistant Professor Hrvoje Brkić, PhD<br>Assistant Professor Antun Šumanovac, MD, PhD |
| Study Programe | Integrated undergraduate and graduate university study of Medicine |
| Status of the course | Elective |
| Year of study, semester | 1st year, 2nd semester |
| ECTS | **2** |
| Workload (hours) | Lectures (8); Seminars (5); Exercises (12) |
| Expected number of students | 30 |
| **COURSE DESCRIPTION** | |
| **Course objectives** | |
| Introducing students to the basic concepts of physics and their application to biological systems. Acquisition of knowledge and skills related to force and motion and their application to the human body. The goal is also to connect the knowledge of anatomy with the mechanical aspects of biological systems and, through the action of forces, to bring closer the usefulness of research for clinical practice and application. The aim is to encourage an analytical, quantitative approach in the study of the functions of the human body. | |
| **Enrolment requirements and entry competencies** | |
| - | |
| **Learning outcomes at the program level** | |
| **1.1., 2.1.** | |
| **Learning outcomes (5-10)** | |
| **1.** Critically judge the mechanisms of operation of biological systems based on knowledge of basic physical laws using simple models<br>**2.** Inorder to provide additional knowledge about the structure of the locomotor system essential for understanding the biomechanical properties<br>**3.** Apply knowledge in biology, anatomy and physics in biomechanical analysis of movements<br>**4.** Measure physical sizes with simpler measuring instruments and be able to interpret results<br>**5.** Apply the acquired knowledge in the interdisciplinary field of biomechanics in practice and independently continue to expand their knowledge in this field. | |
| **Course content** | |
| **Lectures**<br>A historical review. The basics of the structure of connective, bone and cartilage tissue in relation to biomechanical properties. The basics of mechanics. Force as the cause of motion and the cause of deformation of the body. Properties of elasticity and plasticity of biological materials. Simple mechanical models to describe the behavior of biological materials.<br>Seminars:<br>A historical review. The basics of the structure of connective, bone and cartilage tissue in relation | |

to biomechanical properties. The basics of mechanics. Force as the cause of motion and the cause of deformation of the body. Properties of elasticity and plasticity of biological materials. Simple mechanical models to describe the behavior of biological materials.

**Exercises**

Properties of elasticity and plasticity of biological materials. Simple mechanical models to describe the behavior of biological materials

**Mode of teaching**

Lectures; Seminars; Exercises

**Student obligations**

Attendance of all forms of classes is mandatory, and the student must access all knowledge checks. The student can justifiably miss out on 30% of each of the forms of teaching. Undone exercise must be done subsequently.

**Monitoring student work *(alignment of learning outcomes, teaching methods and grading)***

| Teaching activity | ECTS | Learning outcome | Student Activity | Assessment methods | Grade points | |
|---|---|---|---|---|---|---|
| | | | | | Min. | Max. |
| Attendance | 0 | 1-4,6 | Presence teaching | Records | 0 | 0 |
| Exercises | 1 | 5,6 | Presence and active participation in exercises | Exercise diary, knowledge check | 0 | 2 |
| Seminars | 0.5 | 1-4, 6 | Solve default problems on your own, solve default tasks, brief written checks | Essay, records of solved tasks, short written checks | 0 | 3 |
| Written exam | 0,5 | 1-6 | Learning for a written exam | Written exam | 0 | 20 |
| **Total** | **2** | | | | **0** | **25** |

Format Rating

(1) written exam - 20 multiple-answer questions

(2) seminars
a) Problem - preparation of seminars on a given task - up to 3 points. The seminar is presented, in the time provided, seminars can be theoretical or practical

Criterion:
13-25 laid (P)

(3) oral exam (if the student wishes he can apply for an oral exam instead of a written exam).

| **Required reading (available in the library and through other media)** | | |
|---|---|---|
| Title | Number of copies in the library | Availability through other media |
| 1. Jasminka Brnjas - Kraljević: Fizika za studente medicine, Medicinska naklada, Zagreb, 2001. ISBN: 9531761566. | 30 | |
| 2. A. Marušić , J. Krmpotić Nemanić: Anatomija čovjeka, naklada Ljevak, zagreb, 2004. | 19 | |
| 3. V. Nikolić, M. Hudec: principi i elementi biomehanike. Školska knjiga, Zagreb, 1998. (odabrana poglavlja) | 8 | |
| 4. References and materials at Cathedra website | | www.mefos.unios.hr Merlin |
| **Supplementary literature** | | |
| - | | |
| **Course evaluation procedures** | | |
| Anonymous, quantitative, standardized student survey on the reception and work of teachers conducted by the Office for Quality of the Faculty of Medicine Osijek. | | |
| **Note /Other** | | |
| E-learning does not enter the norm of subject hours, but is used in teaching and contains links to different pages, video and audio materials available on websites. | | |