SYLLABUS

1. Course title:

Principles of Biomedical Engineering

2. Code:

BMI202

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

○ Mandatory ◉ Elective

6. Prerequisites:

[ESKE001] Fundamentals of Electrical Engineering I, [RI101] Introduction to Programming

7. Class restrictions:

Students of Faculty of Electrical Engineering, study program Electrical Engineering and Computer Science with fulfille

8. Duration / semester:

1 6

9. Weekly contact hours:

9.1. Lectures: 3

9.2. Seminars: 0

9.3. Laboratory/Practice classes: 1

10. Faculty:

Faculty of Electrical Engineering

11. Department/study program:

Electrical Engineering and Computer Science

12. Lecturer:

Ph.D. Damir Demirović, associate prof.

13. Lecturer's e-mail:

damir.demirovic@untz.ba

14. Web site:

www.fe.untz.ba

15. Course aims:

The goal in this course is introducing the multidisciplinary approach applying engineering principles and design concepts to medicine and biology with intention to improving overall health care of society. Bringing together knowledge of problem solving from many engineering disciplines, bioengineers design medical instruments, devices, computational tools. Students will be introduced to the structures of human body, physiology, and biological signals, medical modalities and medical instrumentation.

16. Learning outcomes:

After successfully completing this course, students can differentiate basic functional and anatomical terms in human body, including physical laws in human body. Students will gain knowledge about basic tasks of biomedical engineers, differentiate methods for imaging, and medical devices used in practice.

17. Course content:

Biomedical engineering, introduction and review. Biotransport. Bioelectrical phenomena. Biofluids. Biomechanics. Biomaterials. Biomedical imaging. Biosensors. Biosignal processing. Medical image modalities, Telemedicine, Biomedical instrumentation and medical measurements. Biomedical optics and lasers.

18. Learning methods:

In order to achieve an efficient teaching and accomplishment of the course objectives and student competencies, during the course will be used the following methods:
- lectures,
- home work

19. Assessment methods:

1. Midterm
2. Homework
3. Final exam

During the semester, students will have two tests with tasks related to specific areas. Tests will be conducted after completion of planned lectures and theoretical exercises. Each test can bring a maximum of 20 points. Through completion of both tests student can gain maximum of 40 points. To successfully pass the written exam and thus gain the right to the final exam, student has to obtain, from all three tests, minimum 20 (twenty) points.

Homework
Students will solve several assignments at home, and present it to lecturer. For doing and presenting homework can gain maximum of 15 points.

Final exam
During final exam student solve theoretical and practical problems which brings maximal 40 points. To successfully pass the final exam student has to obtain minimal 20 points. Each assesment is passed if gains minimal 50% of points. To successfully pass the course student must gain minimal of 54 cummulative points, in which are minimal 20 points obtained from final exam.

20. Assessment components:

The grading system, participation of particular components in percentage and the method for forming a final grade is presented as follows:

Criterion	max. number of points
- attendance and activities at the lectures and exercises	5
- homework/tests	15
- midterm:	40
- final exam:	40
Total points:	100

Students can gain 5 points for attending lectures and exercises and for activity during the semester. Students can gain maximum of 15 points (15%) for doing and presenting homeworks successfully. The rest of students can gain at midterm and final exam.

21. Required reading list:

- S.V. Madihally, Principles of Biomedical Engineering, Artech House, London, 2010
- J. Enderle et all., Introduction to Biomedical Engineering, Second Edition, Elsevier Academic Press, 2005
- K. J. Blinowska, J Zygierewicz, Practical Biomedical Signal Analysis Using MATLAB, CRC Press, 2012

22. Web sources:

23. Applicable starting from the academic year:

2016/17

24. Adopted in the Faculty/Academy session:

04.04.2016