SYLLABUS

1. Course title:

Modeling and simulation of mechatronic systems

2. Code:

3. Cycle of study:

1

4. ECTS credits:

3

5. Type of course:

○ Mandatory ◉ Elective

6. Prerequisites:

7. Class restrictions:

8. Duration / semester:

1 6

9. Weekly contact hours:

9.1. Lectures: 2

9.2. Seminars: 0

9.3. Laboratory/Practice classes: 1

10. Faculty:

Faculty of Mechanical Engineering

11. Department/study program:

Mechatronic / Mechatonic

12. Lecturer:

dr.sc. Almir Osmanović, Assistant Professor

13. Lecturer's e-mail:

almir.osmanovic@untz.ba

14. Web site:

www.mf.untz.ba

15. Course aims:

The main goal of the course is to provide students with the knowledge and skills needed for mathematical modeling and simulation of mechatronic systems, regarding to the mechanical, electrical, thermo, fluid and mixed systems.

16. Learning outcomes:

At the end of the semester, successful students, who continued to perform their duties throughout the academic year, will be trained to perform computer simulations and validation of mechatronic systems.

17. Course content:

Types and models of mechatronic systems. Physical systems and model of physical system (mechanical, electrical, thermo, fluid and mixed systems). Characteristics of the mathematical model of the system. Mathematical description of dynamics mechatronic systems. Description of the system with differential equations, transmission functions and frequency characteristics. Modeling of physical - mechatronic systems. Modeling of linear and nonlinear continuous systems. Basics of the Matlab programming system, operations, functions. Symbolic package. Basic Functions. Functions of mathematical analysis. Linear algebra functions. Functions for solving equations. Simulation of dynamic systems in the Simulink program package. Basic Techniques in Simulink. Advanced techniques in Simulink.

18. Learning methods:

Lectures, computer exercises, consultations, assignments / project papers.

19. Assessment methods:

Written examination - student solves questions / tasks in a given time period related to the subject of study.
Final Exam - oral answer to the questions asked by professors.

20. Assessment components:

Evaluation will be based on the following activities:
Attendance at lectures - 3 points
Written examination (2 x 14) - 28 points
Theoretical part of exam (2 x 18) - 36 points
Final Exam (Oral) - 33 points
Total: 100 points

21. Required reading list:

Janschek K. (2012): Mechatronic Systems Design - Methods, Models, Concepts. Berlin: Springer-Verlag.
Amos G. (2011): Matlab An Introduction with Applications. New York: John Wiley & Sons, Inc.

22. Web sources:

23. Applicable starting from the academic year:

2015/16

24. Adopted in the Faculty/Academy session:

01.06.2015