SYLLABUS

1. Course title:

Systems Modeling

2. Code:

EEMS105

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

◉ Mandatory   ◯ Elective

6. Prerequisites:

[EEMS004] Matrix Methods in Electrical Engineering

7. Class restrictions:

8. Duration / semester:

1   5

9. Weekly contact hours:

9.1. Lectures: | 3

9.2. Seminars: | 1

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. Amir Tokić, full professor

13. Lecturer's e-mail:

amir.tokic@untz.ba

14. Web site:

15. Course aims:

The main objective of this course is to give students the basic knowledge and skills in methods, techniques and software tools for modeling the various types of continuous dynamic systems and the introduction to appropriate analogies of different kinds of dynamical systems.

16. Learning outcomes:

At the end of the course, students will get the knowledge and skills to: analyze systems such as: electrical, mechanical translatory, mechanical rotational, fluid and thermal systems, model both linear and nonlinear systems, present the before mentioned systems in a form of a state space, compare different systems by introducing analogies, use the software packages for modeling and simulation.

17. Course content:

Concepts and definitions of modeling and simulation. The advantages of modeling and simulation. Different approaches in modeling of systems. Modeling of linear systems. Modeling of electrical systems. The method of generating the state-space matrices. Modeling of mechanical translatory systems. Modeling of mechanical rotational systems. Modeling of fluid systems. Modeling of thermal systems. Analogies of models/systems. The general approach in modeling of different types of dynamical systems. The general approach of generating the state-space matrices. Topological problems and algebraic loops. Time constants. Modeling of nonlinear systems. Linearization of the model. Introduction to software packages for modeling and simulation

18. Learning methods:

Lectures and exercises - the classic learning approach using the board and table is applied.
Laboratory exercises - mandatory attendance of students and active participation in class. Exercises are performed in a computer center using the appropriate software packages.

19. Assessment methods:

The exam is written and oral. The written exam is a combination of theoretical issues and computational examples done on lectures and exercises. The final exam is oral exam consisting of discussion of theoretical issues.

20. Assessment components:

Rating exam is based on the total number of points that student earned by completing pre-exam and a final exam. The student can achieve a maximum of 100 points according to the following scale:

Test 1 - 45

Test 1 - 45

Total Prerequisites: 90

Final exam: 10

21. Required reading list:

A. Tokić: "Modelovanje i simulacija kontinualnih sistema", PrintCom, Tuzla, 2010.

F. E. Cellier: "Continuous System Modeling", Springer-Verlag, New York, 1991.

F. E. Cellier: "Continuous System Simulation", Springer-Verlag, New York, 2006.

22. Web sources:

23. Applicable starting from the academic year:

2016/2017

24. Adopted in the Faculty/Academy session:

04.04.2016.