SYLLABUS

1. Course title:

Dynamics of current processes

2. Code:

(max. 20 characters)

3. Cycle of study:

1

4. ECTS credits:

3

5. Type of course:

○ Mandatory ◉ Elective

6. Prerequisites:

No

7. Class restrictions:

No

8. Duration / semester:

1 8

9. Weekly contact hours:

9.1. Lectures: 2

9.2. Seminars: 1

9.3. Laboratory/Practice classes: 0

10. Faculty:

Faculty of Mechanical Engineering

11. Department/study program:

Power Mechanical Engineering

12. Lecturer:

Fikret Alić, Associate Professor

13. Lecturer's e-mail:

fikret.alic@untz.ba

14. Web site:

www.mf.untz.ba

15. Course aims:

Acquisition of theoretical knowledge and practical skills from the dynamics of the current process. Yes, students know the basic principles and stages of mathematical modeling of objects and processes. In order to enable the writing of basic balance equations that describe the unbalanced state of the facilities and processes that after a suitable choice size condition, managed, management and disturbances allow writing adequate representations of the widest range of facilities and processes in space conditions

16. Learning outcomes:

Define different types of systems and processes, carry out the classification model, set the appropriate model for the observed system, analyze the default model, use the method for solving dynamic models of complex energy systems, use numerical methods for solving systems of nonlinear differential equations. Solving technical problems of regulation thermo-hydraulic processes as dynamic systems with distributed parameters.

17. Course content:

Information about the subject. Introduction to mathematical modeling processes. Description of the process and system. The equations of conservation. Discretization of the analyzed system. The classification model. Process analysis principles of mass transfer, momentum and energy. Kinetics and dynamics of the subsystem. Methods for solving equations of dynamics. The stability and sensitivity of the system. Dynamics of complex energy systems. Numerical methods of solving systems of nonlinear differential equations. The use of numerical models in systems management and automation of complex processes. Strategic planning process control in extreme situations.

18. Learning methods:

For the purpose of effective teaching and to achieve the objectives of the course and competence of students during the course will be used the following methods:
• lectures using multimedia resources with active participation and discussion of students;
• Preparation and elaboration of cases in Exercises;
• Presentation in the real environment.

19. Assessment methods:

After half of the semester, students take the writing test, which includes previously treated topics with lectures. test It consists of a group of multiple-choice questions, the group questions the simple recall and group essay type questions. Student total in the first test can achieve 20 points. The test is taken by all students in the course at the same time thereby achieving uniformity of the level of knowledge that is being tested, as well as the conditions in which the student takes the exam.
Also after the second half semestrea students take the written test for the second part of the topics covered in lectures Skop. The test is scored as the first test with 20 points.
The final exam is oral. Right to take the final exam is given to students who have achieved at each of the previous ways of testing a minimum of 50% points of the total number that can be achieved.
At the oral exam students answer three questions drawn from the program of the subject treated in class. Oral exam can be taken if a student answers to all three questions. The maximum number of points a student can achieve at the oral exam is 50 points.
Checks on all forms of knowledge are recognized as a cumulative exam if the achieved result is positive after each individual test and at least 50% of the total scheduled or required knowledge and skills.
In order for the student to pass the subject must achieve a minimum of 54 cumulative points of which a minimum of 25 points on the final exam.

20. Assessment components:

Rating exam is based on the total number of credits a student gained fulfilling exam prerequisites and passing exams and contains a maximum of 100 points, according to the following scale

Students' obligations	Points
Presence in classes	10
Test I	20
Test II	20
Total prerequisites given	50
Final Exam	25-50

21. Required reading list:

1. Kecman V., (1988) Dinamika procesa, Zagreb, Liber
2. Dolezal, R., Varcop, L. (1979) Process Dynamics, New York,Elsevier Applied Sciences
3. Ogata, K. (1992) System Dynamics, Prentice Hall Int.

22. Web sources:

23. Applicable starting from the academic year:

2015/16

24. Adopted in the Faculty/Academy session:

01.06.2015.