SYLLABUS

1. Course title:

Automatic control

2. Code:

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

(●) Mandatory ( ) Elective

6. Prerequisites:

7. Class restrictions:

8. Duration / semester:

1 7

9. Weekly contact hours:

9.1. Lectures: 3

9.2. Seminars: 1

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 introduce students with fundamental knowledge from the theory of technical systems control, which are basic techniques for analysis and design of appropriate systems. The second aim is to present modern softwares and hardwares tools for the analysis, design and implementation of the automatic control system.

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: Analyze and design automated control systems, used modern software and hardware tools to analyze, design and implement automated control systems.

17. Course content:

Basic concepts and principles of automatic control systems, control with open and closed feedback. Mathematical descriptions of continual linear and nonlinear systems. Mathematical modeling of mechanical, electrical, electromechanical, hydraulic, pneumatic and thermal systems. Linearization of nonlinear system models. Solving models of linear time invariant systems. Laplas transformation and concept of transmission function. Block diagram. Algebra block diagrams and graph of signal flow. Mejson's formula. Evaluation of automatic control system quality in transitional and steady regime. Stability of dynamic systems and system stability analysis by algebraic methods. Method of the geometry roots. Design of linear regulator with pole positioning in the domain of transmission functions. All stabilizing regulators. Integral-differential compensators. PID regulator design. Advanced automatic control.

18. Learning methods:

Lectures - theoretical lectures, active two-way communication student - professor, mandatory attendance of students.
Auditorial exercises - problem solving with subjects related to subject matter, active two-way communication student - assistant, mandatory attendance of exercises.
Laboratory exercises - laboratory work, acquisition of practical skills related to subject matter, active two - way communication student - assistant, mandatory attendance of exercises.
Assignments, project paper.

19. Assessment methods:

Defense of Assignments, project paper work - student defends his / her work in front of the professor / assistant - answers questions asked.
Written examination (from the theoretical part and the tasks) - student solves questions / tasks in the given time period related to the subject of study.
Report on laboratory exercises - submission of reports on the activities related to the realization of certain laboratory exercises, answering questions asked by the assistant.
Final (oral) Exam - answer the questions asked by professors.
Corrective Exam (Written examination) - solving questions / tasks in a given time period related to the subject of study.
Corrective Exam (oral examination) - answer the questions asked by professors.

20. Assessment components:

Evaluation will be based on the following activities:
Written examination (2 exam x 12.5) - 25 points
Theoretical part of exam (2 exam x 17.5) - 35 points
Final (oral) exam - 30 points
Assignments, project paper - 10 points
Total: 100 points

21. Required reading list:

Dorf R.C., 2010. Modern Control Systems. New Jersey: Prentice Hall.
Golnaraghi F., Kuo B.C., 2009. Automatic Control Systems. New Jersey: Wiley.
Šurina T., 1974. Analiza i sinteza servomehanizama i procesne regulacije. Zagreb: Školska knjiga.

22. Web sources:

23. Applicable starting from the academic year:

2015/16

24. Adopted in the Faculty/Academy session:

01.06.2015