# SYLLABUS

**1. Course title:**

Basics of systems theory

**2. Code:**

**3. Cycle of study:**

1

**4. ECTS credits:**

3

**5. Type of course:**

Elective

**6. Prerequisites:**

**7. Class restrictions:**

**8. Duration / semester(s):**

1    1

**9. Weekly contact hours and student workload:**

| | | | | (for two-semester courses) | Workload: (hours) | |
|---|---|---|---|---|---|---|
| Semester (1) | 1 | Semester (2) | | | | |
| 9.1. Lectures | 2 | | | | Classes: | 33,8 |
| 9.2. Seminars | 0 | | | | Individual work: | 56,1 |
| 9.3. Laboratory / Practice classes | 1 | | | | In total: | 89,9 |

**10. Faculty:**

Faculty of Mechanical Engineering Tuzla

**11. Department/study program:**

all

**12. Lecturer:**

Dr. sc. Edin Cerjaković, van.prof.

**13. Course aims:**

The primary objective of this course is to introduce students to the development of science and technology through its highest point, and understanding of the principles based on which over time solve problems and came to the understanding and demonstration of natural laws. Through the processing of various types of system students will be

presented to the scientific principle of solving problems by applying a systematic approach, and the way of transformation of a particular problem in the system display.

## 14. Learning outcomes:

Bearing in mind that the case be listening to the first cycle of education in the first semester, students will after successfully coursework of exams have competence to: understand the characteristics of the system and the system, perform the transformation of the problems in the system display, choose the method of system analysis and draw conclusions based on the results, the application systematic approach to problem solving.

## 15. Course content:

1. Introduction (2)
2. History of Technology (2)
3. History of Technology (2)
4. The development of science - Philosophical Paradigm (2)
5. The development of science - Mechanistic paradigm (2)
6. The development of science - System access (2)
7. Description and characteristics of the system (2)
8. Natural and organizational systems (2)
9. Technical systems (2)
10. Technical systems (2)
11. The structure of the system (2)
12. The structure of the system (2)
13. Manufacturing system (2)
14. Cybernetic systems (2)
15. The analysis system (2)

## 16. Learning methods:

In order to effectively deliver the course and achieve the set course objectives and student competencies, the following methods will be used during the course:
• lectures,
• laboratory exercises,
• individual and team/group work,
• presentation in a real environment..

## 17. Assessment methods:

Lectures - theoretical lectures, active two-way communication between student and professor, compulsory attendance of students;
• Theory tests - solving tests;
• Tests with tasks - solving tests;
• Seminar/graphic works – independent work of the student to solve the problem;
• Oral final exam - interactive conversation with the student in order to validate the acquired knowledge;
• Consultations – clarification of possible ambiguities related to the topic of the studied subject.

The condition for signing is the student's attendance at a minimum of 70% of lectures and exercises.
Grading Scale:

| Grade | Descriptive | Letter | Points |
|---|---|---|---|
| 5 (five) | Does not meet minimum criteria | F, FX | <54 |
| 6 (six) | Meets minimum criteria | E | 54÷64 |
| 7 (seven) | Generally good, but with significant shortcomings | D | 65÷74 |
| 8 (eight) | Average, with noticeable errors | C | 75÷84 |
| 9 (nine) | Above average, with occasional errors | B | 85÷94 |
| 10 (ten) | Exceptional success with no errors or with minor errors | A | 95÷100 |

## 18. Assessment components:

1. Attendance at lectures (30×0.207=6.5)
2. Attendance at exercises (15×0.233=3.5)
3. Seminar work (1×15=15)
4. Theory test (2 tests - 2×10=20)
5. Tests with tasks (2 tests - 2×10=20)
6. Final exam (35)
By continuous activities of checking the student's knowledge during the semester (sequential number: 1, 2, 3, 4 and 5), the student can win 65% of the total number of points, and by passing the final exam another 35% of the total number of points.

**19. Mandatory reading list:**

1. E.Cerjakovic: Predavanja iz predmeta Osnove teorije sistema, Mašinski fakultet, Tuzla
2. Đ. Nadrljanski, M. Nadrljanski: Kibernetika u obrazovanju, Univerzitet u Novom Sadu

**20. Additional reading list:**

1. D. Zelenović: Osnove teorije industrijskih sistema, FTN, Novi Sad
2. S. Kukoleča: Osnovi teorije organizacionih sistema, FON, Beograd

**21. Web sources:**

**22. Applicable from the academic year:**

2025/2026

**23. Adopted in the Faculty/Academy session:**

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