# SYLLABUS

**1. Course title:**

Introduction to Computer Algorithms

**2. Code:**

RI203

**3. Cycle of study:**

1

**4. ECTS credits:**

6

**5. Type of course:**

(•) Mandatory ( ) Elective

**6. Prerequisites:**

[RI101] Introduction to Programming

**7. Class restrictions:**

**8. Duration / semester:**

1 4

**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. Edin Pjanić, assistant prof.

**13. Lecturer's e-mail:**

edin.pjanic@untz.ba

**14. Web site:**

**15. Course aims:**

Course goal is to provide a solid background in general computer algorithms, algorithm analysis and several algorithm design paradigms so that the students will be able to analyze problems and implement efficient algorithms in common engineering design situations.

**16. Learning outcomes:**

Students who complete the course should be able to:
- Explain main algorithm design paradigms in algorithm design and analysis.
- Analyze worst-case running times of algorithms using asymptotic analysis.
- Identify and analyze problems and implement efficient algorithms in common engineering design situations.

**17. Course content:**

Mathematical basics of computer algorithms. Mathematical induction. Recurrences. Analysis of algorithms. Asymptotic complexity and its notation. Recursion. Master Method. Elementary search and sort algorithms. Text search. Hash functions. Divide and conquer paradigm. Dynamic programming. Greedy algorithms.

**18. Learning methods:**

Lectures are accompanied by presentations and other materials which are uploaded on the course web site. Discussions with teaching assistant, laboratory excersizes and homeworks.

**19. Assessment methods:**

Continuous assessments are performed during the semester (homeworks, quizzes), two or three midterm tests and a final exam. The final exam includes the questions related to the entire content of the course, focusing on the areas that are not covered by the midterm tests.

**20. Assessment components:**

Grading scale:
Homeworks, quizes: 40%
Midterm tests: 40%
Final exam: 20%
The final grade is based on the continuous assessments that are performed during the semester (homeworks, quizzes) and the final exam.

**21. Required reading list:**

Cormen, Leiserson, Rivest, and Stein, Introduction to Algorithms, MIT Press, 2009.
R.Sedgewick, "Algorithms in C++, Parts 1-4: Fundamentals, Data Structure, Sorting, Searching", Third Edition, Addison-Wesley, 1998.

**22. Web sources:**

**23. Applicable starting from the academic year:**

2016/2017

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

04.04.2016