SYLLABUS

1. Course title:

NUMERICAL METHODS IN ENGINEERING

2. Code:

(max. 20 characters)

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course:

(•) Mandatory ( ) Elective

6. Prerequisites:

(max. 110 characters)

7. Class restrictions:

(max. 150 characters)

8. Duration / semester:

1 3

9. Weekly contact hours:

9.1. Lectures: 3

9.2. Seminars: 0

9.3. Laboratory/Practice classes: 1

10. Faculty:

Faculty of Technology

11. Department/study program:

Chemical Engineering and Technologies, Environmental Protection Engineering

12. Lecturer:

Professor Muhamed Bijedić

13. Lecturer's e-mail:

muhamed.bijedic@untz.ba

14. Web site:

www.tf.untz.ba

15. Course aims:

to acquaint students of engineering with the potentialities of the modern computer for solving numerical problems,
to give students an opportunity to improve their skills in programming and problem solving,
to help students understand some of the many methods for solving engineering problems on a modern computer,
to help students arrive at an understanding of the important subject of errors that inevitably accompany computing,
to examine the underlying algorithmic techniques so that students learn how the computer finds the answer.

16. Learning outcomes:

formulating a mathematical model of an engineering problem to be solved on a computer,
devising or choosing algorithm, together with a preliminary error analysis, for solving the problem,
transforming the suggested algorithm into a set of unambiguous step-by-step instructions to the computer.

17. Course content:

Finding root of equation. Interpolation and extrapolation. Curve fitting. Optimization. Numerical integration. Numerical differentiation. Numerical ordinary differential equations. Numerical partial differential equations.

18. Learning methods:

Lectures, laboratory classes, consultations.

19. Assessment methods:

Test 1: Eight questions from theory taught during the first third of semester.
Assignment 1: Two exercises like those exercised during the first third of semester.
Test 2: Eight questions from theory taught during the second third of semester.
Assignment 2: Two exercises like those exercised during the second third of semester.
Test 3: Eight questions from theory taught during the last third of semester.
Assignment 3: Two exercises like those exercised during the last third of semester.
Final exam: Ten questions from theory taught during the semester.

20. Assessment components:

Tests: 24 points (3 tests by 8 points, where each correct answer to the question from theory carries 1 point)
Assignments: 24 points (3 assignments by 8 points, where each correctly solved exercise carries 4 points)
Lectures attendance: 1 point
Laboratory classes attendance: 1 point
Final exam: 50 points (each correct answer to the question from theory carries 5 points)

Final grade is based on total points earned during the semester, in any way.

Grading system: F (0-53 points), E (54-63 points), D (64-73 points), C (74-83 points), B (84-93 points), A (94-100 points)

21. Required reading list:

Press, W.H., Teukolsky, S.A., Vetterling, W.T., Flannery, B.P., Numerical Recipes, Cambridge University Press, 2007.
Cheney, W., Kincaid, D., Numerical Mathematics and Computing, Thomson Brooks/Cole, 2008.
Conte, S.D., de Boor, C., Elementary Numerical Analysis, McGraw-Hill, 1980.

22. Web sources:

(max. 687 characters)

23. Applicable starting from the academic year:

2015/2016

24. Adopted in the Faculty/Academy session:

(max. 10 char.)