SYLLABUS

1. Course title:

Numerical Methods in Mechanical Engineering

2. Code:

3. Cycle of study:

1

4. ECTS credits:

3

5. Type of course:

○ Mandatory ◉ Elective

6. Prerequisites:

7. Class restrictions:

8. Duration / semester:

2 1

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:

Energy Department, Production Department, Mechatronic Department

12. Lecturer:

dr.sc. Salko Cosic

13. Lecturer's e-mail:

salko.cosic@untz.ba

14. Web site:

www.mf.untz.ba

15. Course aims:

The primary goal is to give students an understanding of the essential of numerical modeling and by usage of modern numerical software tools to solve practical problems in mechanical engineering.

16. Learning outcomes:

After successful completion of the course, student will be able for numerical modeling of practical computation problems in mechanical engineering and to solve it by moder numerical software tools.

17. Course content:

Introduction, contents and objectives of course,
errors in numerical computations, source and propagations
system of linear equations, basic algorithms, examples
nonlinear equations, systems of nonlinear equations, basic algorithms, examples
interpolation and approximation methods, SPLINE, examples in mechanical engineering
numerical integration and differentiation
numerical integration of ODE, examples in mechanics and strength of materials
CDM, heat equation, numerical solution
Numerical methods in dynamics, eigenvalue problem, Newmark algorithm
PDE, Finite Element Method in solid mechanics

18. Learning methods:

Lectures, computer exercises, seminar presentations, consultations

19. Assessment methods:

Test of theory and practical test on computer. Seminar presentation can replace test of theory. The final mark is average between both tests.

20. Assessment components:

Test of theory: 2x25 points (50 %)
Practical test on computer: 2x25 points (50 %)
Seminar presentation: max 2x25 points (50 %)
Final exam: 100 points (100 %)

21. Required reading list:

1. D. Tošić, "Uvod u numeričku analizu", ETF Beograd 1997 god.
2. J. Hoffman, "Numerical methods for engineers and scientists", Marcel Dekker 1996 god.
3. I.Demirdžić: "Numerička matematika", Mašinski fakultet Sarajevo 1995 god.

22. Web sources:

www.mf.untz.ba

23. Applicable starting from the academic year:

2015/16

24. Adopted in the Faculty/Academy session:

(max. 10 char.)