SYLLABUS

1. Course title:

Software Tools in 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:

1 1

9. Weekly contact hours:

9.1. Lectures:	2
9.2. Seminars:	0
9.3. Laboratory/Practice classes:	1

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 CAS packages as well usage of modern engineering software tools necessary to conduct complex computations and results visualization in engineering applications.

16. Learning outcomes:

After successful completion of the course, student will be able to analyze and by CAS software tool obtain solutions to different computational problems in mechanical engineering.

17. Course content:

Introduction, contents and objectives of course,
CAS systems, MAPLE, MATLAB, MATHCAD, development, properties
The data types, elementary arithmetic computations, system of linear and nonlinear equations
Vectors, matrices, linear algebra computations
Examples of applications in physics, mechanics
functions, differential and integral calculus
interpolation and approximations
computer graphics, visualization of results, 2D and 3D examples
programming in CAS environment, advanced options

18. Learning methods:

Lectures, software exercises, seminar presentations, consultations

19. Assessment methods:

Test of theory and test in programming problems. 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 computational test: 2x25 points (50 %)
Seminar presentation: max 2x25 points (50 %)
Final exam: 100 points (100 %)

21. Required reading list:

1. MATLAB for Scientists and Engineers, Brian Hahn, Butterworth- Heinemann 2002
2. Applied MAPLE for Engineers and Scientists, C. Tocci, S. Adams, ArctecHouse 2006
3. Maple and Mathematica, A Problem Solving Approach, I. Shingareva, Carlo, 2000

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.)