

SYLLABUS

1. Course title:

TECHNOLOGY OF PLASTICITY I

2. Code:

(max. 20 characters)

3. Cycle of study:

1

4. ECTS credits:

6

5. Type of course: Mandatory Elective**6. Prerequisites:**

Enthusiasm to learn the subject

7. Class restrictions:

(max. 150 characters)

8. Duration / semester:

1

5

9. Weekly contact hours:

9.1. Lectures:

2

9.2. Seminars:

1

9.3. Laboratory/Practice classes:

1

10. Faculty:

Mechanical Faculty

11. Department/study program:

Production Mechanical Engineerin

12. Lecturer:

dr.sc. Emir Šarić, associate prof.

13. Lecturer's e-mail:

emir.saric@untz.ba

14. Web site:

www.mf.untz.ba

15. Course aims:

It is to understand and explain fundamentals of plastic deformation: dislocations, yield conditions, stress and strain relation, temperature effects on microstructural changes and hardening, friction and wear due to plastic deformation, formability and forming limit diagrams

This knowledge will be prerequisites to design and analyze metal forming processes

16. Learning outcomes:

After learning course the students should be able to:

- explain yield mechanism of metals
- explain strain-stress relation and effects of strain rate and temperature on the flow curve
- construct flow curve based on experimental data from tensile and compression experiments
- determine friction factor and friction coefficient experimentally using the ring compression and compression test by conical tools
- construct forming limit diagrams based on experimental data

17. Course content:

Introduction, dislocations, slip systems, monocrystal and polycrystal plastic deformation, stress tensor, principal stresses, strain tensor, principal strains, stress-strain relations, flow curves, flow criteria, strain hardening, Bushinger-s effect, effect of strain, strain rate and temperature on hardening, work of plastic deformation, friction and wear due to plastic deformation, metal formability

18. Learning methods:

Lecture and Discussions: voice and Power point lecture notes
Practice: Numerical examples and homework handout problems
Seminar paper - summarized in report

19. Assessment methods:

Midterms exams during scheduled exam weeks
Final exam
Seminar paper
Activity during lectures

20. Assessment components:

2 tests (Computational tasks)	30 %
Seminar paper	20 %
Final exam (Theory)	45 %
Attendance and activity	5 %

21. Required reading list:

1. J. Chakrabarty, Theory of Plasticity, 2nd edition, McGraw Hill Publications 1998
2. B.Musafija: Obrada metala plastičnom deformacijom, MF Sarajevo
3. H.Đukić, P.Popović: Obrada Deformisanjem, MF Mostar

22. Web sources:**23. Applicable starting from the academic year:**

2015/16

24. Adopted in the Faculty/Academy session:

01.06.2015