SYLLABUS

1. Course title:

LASER TECHNOLOGIES

2. Code:

3. Cycle of study:

1

4. ECTS credits:

3

5. Type of course:

Elective

6. Prerequisites:

7. Class restrictions:

8. Duration / semester(s):

1 5

9. Weekly contact hours and student workload:

	Semester (1)	Semester (2)	(for two-semester courses)	Workload: (hours)
9.1. Lectures	2		Classes:	33,75
9.2. Seminars	1		Individual work:	55,92
9.3. Laboratory / Practice classes	0		In total:	89,67

10. Faculty:

Faculty of Mechanical Engineering Tuzla

11. Department/study program:

Production Mechanical Engineering

12. Lecturer:

Dr.sc. Samir Butković,professor

13. Course aims:

Acquiring theoretical and practical knowledge in the field of material processing by laser.

14. Learning outcomes:

- Independently perform calculations of laser systems for various applications.
- Describe interaction of the laser beam and a suitable material which facilitates the selection of the parameters of the laser system for particular laser processing of materials (cutting, welding, heat treatment, surface alloying, etc.)

15. Course content:

1. Introduction in laser technologies,
2. Laser beam properties,
3. Laser devices,
4. Systems for the shaping of laser beam,
5. Material/laser interaction,
6. Laser types,
7. Test I, Laser cutting
8. Laser hardening,
9. Laser welding,
10. Laser deposition (cladding),
11. Laser micromachining,
12. Laser measuring principles,
13. Application of lasers in powder metallurgy,
14. Selective laser sintering/melting,
15. Test II

16. Learning methods:

Lectures with active participation of students,
Exercises,
Consultations,
Preparation and presentation of seminar papers.

17. Assessment methods:

Activity during lectures,
2 tests (solving of tasks),
2 test (understanding of theory)
Seminar/homework papers,
Final exam,

Knowledge tests results are recognized as cumulative result if achieved results are positive after each individual exam and gives at least 50% of the planned and/or the necessary knowledge and skills. In order to pass the subject the student must achieve a minimum of 54 cumulative points.

The condition for signing is the student's attendance at a minimum of 70% of lectures and exercises.
Grading Scale:

Grade	Descriptive	Letter	Points
5 (five)	Does not meet minimum criteria	F, FX	<54
6 (six)	Meets minimum criteria	E	54÷64
7 (seven)	Generally good, but with significant shortcomings	D	65÷74
8 (eight)	Average, with noticeable errors	C	75÷84
9 (nine)	Above average, with occasional errors	B	85÷94
10 (ten)	Exceptional success with no errors or with minor errors	A	95÷100.

18. Assessment components:

Attendance and activity during lectures, 6 points
2 tests (solving of tasks), 2 tests x 10 points=20 points
2 test (understanding of theory), 2 tests x 12 points=24 points
Seminar/homework papers, 10 points
Final exam, 40 points

19. Mandatory reading list:

1. I. Belić: „Obrada metala laserskim zračenjem“, Beograd, 2003. Godine.
2. Dejan Milošević:"Osnovi laserske fizike (sa zbirkom riješenih zadataka)", Prirodno-matematički fakultet u Sarajevu, 1996.
3. John F. Ready, INDUSTRIAL APPLICATIONS OF LASERS, Honeywell Technology Center Minneapolis, Minnesota, Second Edition, 1997 by Academic Press.

20. Additional reading list:

1. Laser Applications, Bilten Laser Inc., 2000. godine

21. Web sources:

22. Applicable from the academic year:

23. Adopted in the Faculty/Academy session: