SYLLABUS

1. Course title:

Workspace design

2. Code:

3. Cycle of study:

I

4. ECTS credits:

3

5. Type of course:

Elective

6. Prerequisites:

No prerequisites

7. Class restrictions:

None

8. Duration / semester(s):

I | VII

9. Weekly contact hours and student workload:

Semester (1)	1	Semester (2)		(for two-semester courses)	Workload: (hours)
9.1. Lectures	2			Classes:	33,75
9.2. Seminars	0			Individual work:	56,21
9.3. Laboratory / Practice classes	1			In total:	89,96

10. Faculty:

Faculty of Mechanical Engineering Tuzla

11. Department/study program:

Production Engineering / Production Engineering

12. Lecturer:

Alan Topčić PhD, Full Professor

13. Course aims:

The objective of this course is to familiarize students with the fundamental concepts of industrial workplaces and working environments, with the aim of designing safe and comfortable workspaces that enable the efficient execution of work tasks in accordance with production process requirements. The course also aims to develop the ability to recognize and

assess the impact of environmental factors on working conditions, in order to bring them within the limits prescribed by relevant standards and regulations through the application of appropriate preventive and protective measures. Additionally, the course highlights the importance of industrial hygiene and its role in ensuring a healthy and safe working environment in industry.

14. Learning outcomes:

Upon successful completion of the course, the student will be able to:
Define and explain the basic concepts related to the workplace, workspace, and working environment, as well as to recognize their importance within an industrial setting; Understand the principles of workspace design and apply them to the creation of safe, functional, and efficient working environments, taking into account ergonomic characteristics of humans and organizational aspects of the production system; Identify and assess the impact of environmental factors on a specific workplace/worker and, based on these insights, apply appropriate solutions, methods, and design approaches to ensure a safe and healthy working environment for employees, enabling efficient task execution in accordance with applicable standards and regulations.

15. Course content:

1. **Basic concepts: Workplace / Workspace / Working environment;**
2. **Concept of workspace design;**
3. **Working environment and working conditions; Influential factors of the working environment in workplace design;**
4. **Noise and noise protection;**
5. **Vibrations and vibration protection;**
6. **Air humidity in the workplace;**
7. **Lighting in the workplace;**
8. **Airflow and air quality in the workplace; Test 1;**
9. **Temperature in the workplace;**
10. **Radiation in the workplace – Ionizing radiation;**
11. **Radiation in the workplace – Non-Ionizing radiation;**
12. **Chemical hazards in the workplace;**
13. **Biological hazards in the workplace;**
14. **Industrial dust;**
15. **Fire Protection in the workplace; Test 2.**

16. Learning methods:

LECTURES (PR) – Theoretical lectures using multimedia tools, along with active two-way communication between student and professor;
LABORATORY EXERCISES (LV) – Work in the laboratory and in the field aimed at acquiring practical skills related to the subject matter; Preparation and presentation of seminar and graphical assignments;
CONSULTATIONS – Additional sessions that allow students to clarify specific segments of the lectures/exercises with the professor or assistant after their completion.

17. Assessment methods:

PRE-EXAM OBLIGATIONS: Students are required to take two written tests from the theoretical part (PR) and two from the auditorium exercises (LV). Theoretical tests (PR) are scheduled as follows:
- **After the first third of the semester – First midterm,**
- **At the end of the semester – Second midterm.**

Laboratory exercise tests (LV) are scheduled as follows:
- **After the middle of the semester – First midterm,**
- **At the end of the semester – Second midterm.**

The tests cover the material presented up to that point in lectures and exercises. Theoretical tests (PR) consist of multiple-choice questions, short answer questions, and essay-type questions. Students can earn a maximum of 8 points per midterm — totaling 16 points for all two theoretical tests. Laboratory exercise tests (LV) consist of problems solving, and students can earn a maximum of 6 points per test — totaling 12 points. All students take the tests at the same time, ensuring uniform knowledge evaluation and consistent testing conditions.
As part of the pre-exam obligations, students are required to prepare an individual Seminar paper (PR) on a topic related to the course content. It must be submitted in written form to the course professor for review and evaluation, and then defended orally. Successfully completed and defended Seminar assignment is worth up to 7 points. Students need to prepare an individual Laboratory Exercise Reprt. It must be submitted in written form to the course assistant for review and evaluation, and then defended orally. Each successfully completed and defended Laboratory Exercise Report worth up to 5 points.
For continuous participation during lectures and exercises throughout the semester, students may earn:
- **Up to 20 points from lectures (PR),**
- **Up to 10 points from Laboratory exercises (AV).**

The final exam is oral.

Only students who have successfully fulfilled more than 50% of the pre-exam obligations and attended more than 70% of lectures and exercises are eligible to take the final exam. In the final exam, students must answer five questions from the course material covered in lectures and exercises. The maximum score for the final exam is 30 points.
All forms of knowledge assessment are recognized as part of the cumulative grading system. To pass the course, a student must earn a minimum of 54 cumulative points.
If a student misses lectures/exercises, they are required to provide valid justification.
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:

The exam grade is based on the total number of points that the student earned by fulfilling pre-exam obligations and taking the exam, and contains a maximum of 100 points. It is determined according to the following scale:

- **Attendance at Lectures (PR): 20 points**
- **Theory tests (PR): 2 tests × 8 points = 16 points**
- **Seminar paper (PR): 7 points**
- **Attendence at Laboratory exercises (LV): 10 points**
- **Tests with tasks (LV): 2 tests × 6 points = 12 points**
- **Laboratory Exercise Report (LV): 5 points**

Prerequisites total: 70 points
Final exam: 30 points
TOTAL: 100 points

19. Mandatory reading list:

S. Čičević (2020): "Uvod u ergonomiju", Univerzitet u Beogradu
S. Kirin (2019): "Uvod u ergonomiju", Veleučilište u Karlovcu, Karlovac,
A, Hedge, Ergonomic (2016): "Workplace Design for Health, Wellness, and Productivity", CRC Press

20. Additional reading list:

K. Dundović, Z.Perić (2020) "Organizacija zaštite na radu", Veleučilište u Rijeci
C. McKeown (2016): "Ergonomics in Action: A Practical Guide for the Workplace", CRC Press
T. Jespen (2016): "Risk Assessments and Safe Machinery Ensuring Compliance with the EU Directives"
E. Bluff (2015): "Safe Design and Construction of Machinery"
M. Lehto, S.J.Landry (2013):" Introduction to human factors and Ergonomics for Engineer", CRC Press
B. Mijović (2008): "Primijenjena ergonomija" Veleučilište Karlovac (priručnik)
J. Dul, B. Weerdmeester (2008): "Ergonomics for Beginners: A Quick Reference Guide", CRC Press
K.H.E. Kroemera i E. Grandjeana (2000): "Prilagođavanje rada čovjeku - ergonomski priručnik", Naklada Slap
M. J. O'Neill (2000): "Ergonomic Design for Organizational Effectiveness", CRC Press
K. Vukorepa, A, Burger: "Sigurnost i osnove zaštite na radu", Kontrol biro,Društvo za osiguranje kvaliteta, Zagreb (priručnik)
F. Veljovic: Mikro i makroklima u radnom prostoru (skripta)

21. Web sources:

22. Applicable from the academic year:

2025/2026.

23. Adopted in the Faculty/Academy session:

25.04.2025.