SYLLABUS

1. Course title:

ENVIRONMENTAL DEVELOPMENT

2. Code:

3. Cycle of study:

I

4. ECTS credits:

3

5. Type of course:

Elective

6. Prerequisites:

None

7. Class restrictions:

None

8. Duration / semester(s):

I **II**

9. Weekly contact hours and student workload:

	Semester (1)	Semester (2)	(for two-semester courses)	Workload: (hours)
9.1. Lectures	3		Classes:	33,75
9.2. Seminars	0		Individual work:	53,9
9.3. Laboratory / Practice classes	0		In total:	87,6

10. Faculty:

Faculty of Mechanical Engineering

11. Department/study program:

Energetics and thermo-fluid engineering, Mechatronics, Production engineering

12. Lecturer:

Midhat Osmić, Associate Professor

13. Course aims:

Acquiring theoretical knowledge in the field of sustainable development while meeting the requirements of energy efficiency, basic knowledge about the concept of energy intensity, carbon footprint, use of renewable energy sources and reduced negative impact on the environment, acquisition of basics about the transformation of renewable energy

resources into useful forms of energy, basics about cleaner production and industrial ecology, steps of conducting energy and environmental audits, etc.

14. Learning outcomes:

At the end of the semester/course, successful students, who continuously performed their duties during the entire teaching period, will be able to: define the concept of sustainable development; present ways to achieve sustainable environmental development using measures for energy efficiency; define renewable and non-renewable energy sources and ways of using them, along with measures for more intensive encouragement of the use of renewable energy sources; define negative impacts on the environment as consequences of human activities and measures for their reduction or neutralization.

15. Course content:

Within the scope of the course, the following thematic units will be studied:

1.Introductory considerations about the environment, local, regional and global impacts, concept of carbon footprint, calculation
2. Demographic expansion and economic growth,
3. Concept and goals of sustainable development, strategic goals, environmental management system, advantages of certification, examples of implementation, purpose of awarding the mark,
4.Generally about energy, division, energy resources in the world, energy efficiency and intensity,
5.Renewable energy sources, fossil fuels, nuclear fuels, European energy strategy, situation in BiH)
6. Non-renewable energy resources, characteristics (Coal, state, reserves, Oil and natural gas, state, reserves),
7.Test
8. Air, water and soil pollution caused by the use of fossil fuels,
9.Concept of industrial ecology. Cleaner production.
10.Environmental and energy audit, basics,
10. Examples of conducting environmental and energy audits
11.Renewable energy sources (biomass, water)
12.Renewable energy sources (wind, sun)
13.Renewable energy sources (geothermal, Sea and wave energy)
14. Presentation of group and individual seminar papers;
15.Test

16. Learning methods:

Lectures are conducted in a classical way, using multimedia resources and techniques of active learning and student participation. Preparation and presentation of individual seminar papers, consultations.

17. Assessment methods:

During the semester, students continuously listen to lectures from the subject teaching units. Halfway through and at the end of the semester, students pass the material in the form of a written knowledge test. Evaluation is done by two tests with theoretical questions, where the student must score at least 50% of the points per test. In both cases, theoretical questions carry 20 points each. In addition to tests, during the semester, students prepare an individual or group seminar paper, the submission of which can earn the student 25 points. The student can also get part of the points based on the attendance at lectures and exercises in the amount of 5. The student must have a minimum of 3 points to get the teacher's signature after completing the course.

The final exam carries 30 (20+10) points. In order to pass the course, the student must obtain a minimum of 54 cumulative points, of which 15 points in the final exam.

Grading system: (5) + (40) +(25)+ (30) = (100) points

Descriptive grades For the number of points achieved

Grade	Described	Letter grade	Points
5 (five)	Does not satisfy the minimum criteria	F, FX	<54
6 (six)	Sufficient minimum criteria	E	54-64
7 (seven)	Overall good, but with some significant flaws	D	65-74
8 (eight)	Average, with noticeable flaws	C	75-84
9 (nine)	Above average	B	85-94
10 (ten)	An exceptional success	A	95-100

18. Assessment components:

Grading will be based on the following activities

Pre-exam obligations:
- Active participation during class -5 points
- Tests - 40 points
-Seminar paper-25 points

Final exam:
- Written/oral exam -30 points

Total points 100

19. Mandatory reading list:

1. I.Buljubašić, M.Osmić, Elektrane i okolina, Tuzla, 2020.
2.Đonlagić M.: Energija i okolina, Tuzla, 2005.

20. Additional reading list:

1.Energija iz uglja, stanje i perspektive, Tuzla, 2023.

21. Web sources:

https://mpgi.gov.hr/UserDocsImages/dokumenti/EnergetskaUcinkovitost/Metodologija-2021.pdf
iea-wind.org/wp-content/uploads/2023/05/41_TEM-IntegrationWindHydroSystems_2003.pdf
research-hub.nrel.gov/en/publications/
https://www.collegesidekick.com/study-docs/1088366
https://www.researchgate.net/publication/327231355_INTERNI_AUDIT_U_PREDUZECIMA

22. Applicable from the academic year:

2025/2026

23. Adopted in the Faculty/Academy session: