

## SYLLABUS

**1. Course title:**

Energy resources

**2. Code:**

**3. Cycle of study:**

I

**4. ECTS credits:**

3

**5. Type of course:**

Elective

**6. Prerequisites:**

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**7. Class restrictions:**

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**8. Duration / semester(s):**

1

6

**9. Weekly contact hours and student workload:**

**10. Faculty:**

Faculty of Mechanical Engineering

**11. Department/study program:**

Energy and Thermofluids engineering

**12. Lecturer:**

Ph.D. Sandira Eljšan, full professor

**13. Course aims:**

Acquiring theoretical knowledge and practical skills, and introducing students to energy resources through various sectors of the industry. The aim of the course is to get acquainted in detail with the resources that are used, water (as well as the methods of their preparation and processing), fuels and lubricants, and other resources that are most often used for

various production processes, and the ways of their storage.

#### 14. Learning outcomes:

At the end of the studied subject, the student is expected to:

- to know how to identify energy resources and their use in different sectors of industry,
- to distinguish the physical and chemical properties of water, examine and categorize requirements for water quality, as well as compare some of the water treatment procedures.
- to distinguish some of the basic characteristics of fuel and lubricants as well as their storage.

#### 15. Course content:

Dynamics of processing teaching units by weeks of the semester:

1. Introduction. Energy resources.
2. Use of energy resources in various sectors of industry.
3. Physical and chemical properties of water. Division of water, Industrial and technological water.
4. Basic water preparation processes (Requirements for water quality in industrial and energy plants)
5. Precipitation processes, processes with ion exchangers and membranes. Demineralization and decarbonization.
6. Formation, classification and description of solid fuels. Processing of solid fuels and production of coke.
7. Processes for obtaining gaseous fuels, their properties and applications
8. TEST I
9. Sources of obtaining liquid fuels, properties of oil, oil refining technology, basic characteristics of certain types of fuels obtained from oil.
10. Nuclear fuels, nuclear waste.
11. Fuel storage.
12. Basic characteristics of base oils. Lubricants
13. Newer energy resources
- 14 Electric and hybrid cars.
15. TEST II.

#### 16. Learning methods:

Lectures with the use of multimedia tools, active learning techniques and with active participation and discussions students

- creation of tasks for auditory exercises with the involvement of students
- consultations with teachers on a weekly basis.

#### 17. Assessment methods:

As part of the pre-examination obligations, students are required to prepare an individual (group) 1 (larger) or 2 smaller papers, depending on the size of the group, which will cover a specific topic from the content of the course. The seminar paper is submitted in writing to the subject teacher for review and evaluation, and then presented orally. All students in the group participate in the preparation and presentation of the seminar paper, which is more often evaluated individually. For the completed and presented seminar paper, a student can achieve from 0 to 40 points.

- Two visits to production facilities and reports on the visits carried out carry 10 points.
- The first theory test (plus assignments) can be in the 8th week or in the 15th week of the semester before the final exam (50 points) for those who wish to do so (optional). For those who do not pass through partial exams, there is a final or make-up exam.-

Grade	described	by letter	points
5 (five)	Does not meet minimum criteria	F;FX	<54
6 (six)	meets the minimum criteria	E	54 -64
7 (seven)	Generally good, but with significant flaws	D	65-74
8 (eight)	Average, with noticeable errors	C	75-84
9 (nine)	Above average, with some errors	B	85-94
10 (ten)	Exceptional success without mistakes or with minor mistakes	A	95-100

#### 18. Assessment components:

Grading in the course:

- Reports on two visits 2x5 = 10 points
- Seminar paper (1 or 2 depending on the group) during the semester 40 points
- final exam or remedial exam: 50 points

Pre-examination requirements total number of points: 50 points  
Final exam: 50 points  
total number of points: 100 points

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**19. Mandatory reading list:**

1. Delić I, Alić N., Osmić M., Stuhli V.: „ENERGIJA IZ UGLJA - STANJE I PERSPEKTIVE ", 2024  
2. Šilić Đ, Stojković V., Mikulić D.: Goriva i maziva, 2012.  
3. Gržetić I. PROCESI PRERADE I DORADE VODE, Beograd 2010

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**20. Additional reading list:**

Jugoma: Maziva i podmazivanje, Zagreb, 1996

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**21. Web sources:**

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**22. Applicable from the academic year:**

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**23. Adopted in the Faculty/Academy session:**