

Course title: Power plants

Course code	Course status	Semester	Number of ECTS credits	Lecture hours
131005031	Mandatory	V	4.5	3+1+0+visits

Study program:

Basic academic studies, ELECTRICAL ENGINEERING, study program: Power systems and Control (studies last for 6 semesters, 180 ECTS credits).

Prerequisites: No prerequisites required.

Course aims: Through this subject students are introduced with actual issues considering identification of the energy demands, energy sources, basic characteristics of the production and consumption of the electric energy, types and basic characteristics of the power plants, hydroelectric power plants, steam power plants and unconventional methods for the electric energy production, deregulation and restructuring of the energetic sector, and power plants influence on the environment.

Teacher(s) and assistant(s):

PhD Sreten Škuletić – teacher, MSc Vladan Radulović - assistant

Teaching method:

Lectures (which include exercises), video and CD presentations, visitation to the electro-energetic and power plants. Consultations.

Course synopsis:

Preliminary weeks	Preparation and semester enrolment.
I week	Energy demand. Importance and role of the energy for society development.
II week	Energy sources – classification, types, characteristics, reserves, methods and possibilities for their utilization.
III week	Basic characteristics of the production and consumption of the electric energy. Load and lifetime diagrams.
IV week	Classification and basic characteristics of the power plants. Different types of the energy sources.
V week	Hydroelectric power plants: Introducing remarks. Basic hydrodynamic ideas. Characteristics of the hydroelectric power plants.
VI week	First test
VII week	Free week
VIII week	Basic components of the hydroelectric power plants. Water (hydraulics) turbines. Working characteristics, selection and adjustment of the hydroelectric power plants.
IX week	Classification of the hydroelectric power plants. Hydro-mechanical equipment. Small hydroelectric power plants. Pumped-storage plants.
X week	Steam power plants: Steam power plants types and characteristics. Basic ideas of the thermodynamic.
XI week	Basic components of the steam power plants.
XII week	Second test
XIII week	Basic principles of the steam turbine aggregate regulation. Technological processes in the steam power plants.
XIV week	Nuclear, gas, diesel, steam power plants. Unconventional (new) methods for the electric energy production.
XV week	Schematic circuit diagram of the power plant. Deregulation and restructuring of the energetic sector. Power plants influence on the environment.
XVI week	Final exam
Final week	Administrative procedures.
XVIII-XXI week	Additional lessons, correction of the final exam and administrative procedures.

STUDENT WORKLOAD

<u>per week</u>	<u>per semester</u>
4.5 credits x 40/30 = 6 hours	Teaching and the final exam: (6 hours) x 16 = 96 hours
Working hours structure: 2 hours for teaching 1 hour for exercises 3 hours for individual work, including consultations and home exercises.	Necessary preparation (before semester): 2 x (6 hours) = 12 hours
	Total work hours for the course: 4.5 x 30 hours = 135 hours
	Additional hours for preparing correction of the final exam, including the exam taking: up to 27 hours (the rest of the time from the first two items, up to the total work time for the course, 135 hours).
	Work hours structure: 96 hours (lectures) + 12 hours (preparation) + 27 hours (additional work)

Lessons attendance is mandatory for students, as well as doing both tests.

Literature: 1. prof. dr Sreten Škuletić: „Elektrane“, handout – teaching lessons, 2005.
2. Požar H.: Proizvodnja električne energije I i II, ETF, Zagreb, 1978.
3. Požar H.: Osnove energetike I-III, Školska knjiga, Zagreb, 1992.

The forms of knowledge testing and grading:

- Lessons attendance and visiting the electro-energetic and power plants carry 10 points.
- First test carries 15 points, and second test carries 25 points (40 points total).
- Final exam carries 50 points.

Student gets the passing grade by collecting 55 points at least.

Special remarks for the course: If needed, the course can also be taught in English.

Teacher(s) who provided the information: PhD Sreten Škuletić

Remark: