

Course title: **Application of computers in power systems**

Course code	Course status	Semester	Number of ECTS credits	Lecture hours
PA6105	Mandatory	I	3.5	1L+0E+3Lab

Study program:

Master studies, ELECTRICAL ENGINEERING, study program: Power systems and Control, department: Power systems (studies last for 10 semesters, 300 ECTS credits).

Postgraduate studies, ELECTRICAL ENGINEERING, study program: Power systems and Control, department: Power systems (studies last for 8 semesters, 240 ECTS credits)

Prerequisites: No prerequisites required.

Course aims: Students will be introduced with all aspects of computer applications in power systems (projects for substation, power lines, protection). Besides this, course takes into account calculations of steady states of power systems as well as calculations of short circuits. Students will be introduced with modern software which is used for projects and different calculations of interest for power systems.

Teacher(s) first and last names:

PhD Jadranka Radović - professor, MSc Saša Mujović, MSc Vladan Radulović, MSc Zoran Miljanić - assistants

Studying method:

Lectures, exercises, laboratory and computer exercises, individual work on practical tasks, consultations.

Course synopsis:

Preliminary week	Preparation and semester enrolment.
I week	Models for forecast of energy consumption.
II week	Creation of software for forecast of energy consumption with different forecast models and comparative analysis.
III week	Optimal pathing of overhead lines.
IV week	Selection of location and height of towers for overhead lines.
V week	<i>I practical assignment</i>
VI week	FREE WEEK
VII week	Graphical representation using computers. Symbols for elements of power substations.
VIII week	Projects of main schemes of power substations and power generation stations.
IX week	Calculation of overvoltages in power systems.
X week	Projects of grounding systems. Modern software for preparation of studies in power systems.
XI week	<i>II practical assignment</i>
XII week	Mathematical models of elements of power systems by developing software application.
XIII week	Calculation of currents and voltages in power systems using direct and iterative methods.
XIV week	Calculation of short circuits.
XV week	<i>Final exam – seminar work</i>
XVI week	
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>
Working hours: 3.5. credits x 40/30 = 4 hours and 40 minutes.	Teaching and the final exam: (4hours and 40 minutes) x 16 = 74hours and 40 minutes.
Working hours structure: 1 hours for teaching 0 hour for exercises 3 hours for laboratory exercises 40 minutes for individual work, including consultations.	Necessary preparation (before semester): 2 x (4hours and 40 minutes) = 9hours and 20 minutes. Total work hours for the course: 105hours Additional hours for preparing correction of the final exam, including the exam taking: up to 21hours. Work hours structure: 74hours and 40 minutes (lectures) + 9hours and 20 minutes (preparation) + 21hours (additional work)

Lessons attendance is mandatory for students, as well as doing homework and seminar works, etc.

Literature:

Manuals for software.
Z. Uskoković, Lj. Stanković, I. Đurović : „MATLAB for Windows“

The forms of knowledge testing and grading:

- Two practical assignments carry 40 points.
- Seminar work carries 50 points.
- Attendance to lectures carries 10 points

Student gets the passing grade by collecting **51** points at least.

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

Teacher(s) who provided the information: Ph.D. Jadranka Radović

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