

**Course title: Electric circuit theory**

Course code	Course status	Semester	Number of ECTS credits	Lecture hours
131003138	Mandatory	III	7.5	3+2+1

**Study program:**

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

**Prerequisites:**

Passed final exam in course **Basics of electrical engineering II**.

**Course aims:**

To familiarize students with electric circuits analysis (in time and complex (frequency) domain), i.e., methods of analysis of linear passive and active circuits.

**Teacher(s) and assistant(s) first and last names:**

Ph.D. Budimir Lutovac – teacher  
Ph.D. Vesna Rubežić – assistant

**Studying method:**

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

**Course synopsis:**

Preliminary weeks	Preparation and semester enrolment.
I week	Introduction. Electric circuits and networks. Graph of a circuit.
II week	Electric circuit topology. Kirchhoff's laws. Duality.
III week	Basic excitations in time domain. Magnetically coupled circuits.
IV week	Electric circuit analysis in time domain. Initial condition response.
V week	Total response. State equation system. Convolution and superposition integral.
VI week	<b>First test</b>
VII week	<b>Free week</b>
VIII week	Pseudoperiodic steady state. Periodic steady state – Fourier series. Powers.
IX week	Responses in an electric circuit – Fourier transform.
X week	Response determination by using Laplace transform (solving methods).
XI week	Laplace transform – circuit function. Convolution. Complex electric networks solving.
XII week	Complex electric circuits analysis. Three phase electric circuits.
XIII week	<b>Second test</b>
XIV week	Two-port networks.
XV week	Electric circuits with distributed parameters – transmission lines.
XVI week	<b>Final exam</b>
Final week	Administrative procedures.
XVIII-XXI week	Additional lessons, correction of the final exam and administrative procedures.

**STUDENT WORKLOAD**

per week	per semester
<b>Working hours: 7.5 credits x 40/30 = 10</b> hours.	<b>Teaching and the final exam: (10 hours) x 16 = 160</b> hours.
<b>Working hours structure:</b> 3 hours for teaching 2 hour for exercises 1 hour for laboratory exercises 4 hours for individual work, including consultations.	<b>Necessary preparation (before semester): 2 x (10 hours) = 20</b> hours. <b>Total work hours for the course: 7.5 x 30 hours = 225</b> hours <b>Additional hours</b> for preparing correction of the final exam, including the exam taking: up to <b>45</b> hours. <b>Work hours structure:</b> 160 hours (lectures) + 20 hours (preparation) + 45 hours (additional work)

Lessons attendance is mandatory for students, as well as doing all controls tests (which are randomly organized), laboratory exercises and both tests.

**Literature:**

B. Reljin, Teorija električnih kola I – Rješavanje kola u vremenskom domenu, "Nauka", Beograd.  
B. Reljin, Teorija električnih kola II – Rješavanje kola u frekvencijskom domenu, "Akademska misao" Beograd.  
B. Reljin, Analiza trofaznih električnih kola, Elektrotehnički fakultet, Beograd.  
M. Milić, Teorija električnih kola – Zbornik rešenih problema, "Naučna knjiga", Beograd.  
Dušica Čalović, Rešeni problemi iz teorije električnih kola, "Naučna knjiga", Beograd.  
D. E. Johnson, J. R. Johnson, J. L. Hilburn, Electric circuit analysis, "Prentice-Hall", New Jersey.

**The forms of knowledge testing and grading:**

- Five control tests carry **5** points.
- Laboratory exercises carry **5** points.
- Each test carries **20** points (**40** points total).
- Final exam carries **50** points.

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

**Special remarks for the course:** The teaching is organized for student groups with approximately 50 students and laboratory is organized for groups with 14 students.

**Teacher(s) who provided the information: Ph.D. Budimir Lutovac**

**Remark:**