

Course title: Electric circuit theory

Course code	Course status	Semester	Number of ECTS credits	Lecture hours
131003139	Mandatory	III	7.5	3+2+1

Study program: Basic academic studies, ELECTRICAL ENGINEERING, study program: Electronics, Telecommunications and Computer engineering (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	First test
VII week	Free week
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. Electric filters.
XIII week	Second test
XIV week	Two-port networks.
XV week	Electric circuits with distributed parameters – transmission lines.
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>
Working hours: 7.5 credits x 40/30 = 10 hours. Working hours structure: 3 hours for teaching 2 hour for exercises 1 hour for laboratory exercises 4 hours for individual work, including consultations.	Teaching and the final exam: (10 hours) x 16 = 160 hours. Necessary preparation (before semester): 2 x (10 hours) = 20 hours. Total work hours for the course: 7.5 x 30 hours = 225 hours Additional hours for preparing correction of the final exam, including the exam taking: up to 45 hours. Work hours structure: 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. 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:	