

Program	59EC – Communications Electronic Engineering B. Eng.			
	59SC – Telecommunications Systems Engineering B. Eng.			
	59SO – Sound and Image Engineering B.Eng.			
	59TL – Telematics Engineering B. Eng.			

Course code and name				
Code	595000004, 595000303, 595000103, 595000203			
Name	Circuit Analysis I			
Semester	S1 [(September-January)]			

Credits and contact hours					
ECTS Credits	6				
Contact hours	60				
Contact hours	60				

Coordinator's name	Gil Barba, Marta [marta.gil.barba@upm.es]
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Specific course information						
Tuition language	Spanish					
Description of course content						
Study and application of the basic concepts related to the circuit analysis in constant						
current and in sinusoid	lal steady-state.					
List of topics to be covered						
1. Basic laws						
2. Analysis of resistive circuits						
3. Inductive and capacitive elements						
4. Sinusoidal steady-state						
Lab sessions:	Lab sessions:					
1. Multimeter and circuit board						
2. Measurements of ba	sic magnitudes in o	constant current I				
3. Measurements of ba	sic magnitudes in o	constant current II				
4. Function generator and oscilloscope						
5. Measurements in sinusoidal steady-state						
6. Final assessment of the lab work						
Prerequisites or co-requisites						
None						
Course category in the program						
🗹 R (req	uired)	□ E (elective)				
		(elective courses may not be offered every year)				



Specific goals for the course

Specific outcomes of instruction

- RA25 To know the theorem of overaly and multiplication by a constant. Its application to the circuit analysis.
- RA26 To know the Norton's Theorem and Thevenin's Theorem, their simplifications and equivalents.
- RA28 To know the concept of sinusoidal function and its parameters.
- RA49 To use the overaly theorem to analyze the circuits where different frequency generators appear.
- RA13 To know and apply the basic laws about the circuit study.
- RA1121 To know and apply the fundamental theorems of analysis of circuits: overlay, multiplication by a constant.
- RA16 To analyze the performance of the generators in constant current and their connection current-voltage.
- RA17 To learn about the different types of generators and the equivalence between them.
- RA15 To analyze the performance of passive components (resistors, coils and capacitors) and their connection current-voltage.
- RA14 To analyze circuits in sinusoidal steady-state with constant current.
- RA18 To learn about the different types of generators and the equivalence between them.
- RA19 To generalize about the concept of power launched by the active components.
- RA22 To apply the methods of analysis of a circuit for voltages and currents.
- RA21 To determine the minimum number of equations needed to analyze a circuit.
- RA32 To know the use and utility of the circuit board, polimeters, power source, signal generators and oscilloscope.
- RA700 To express correctly the magnitudes measured in electrical circuits using properly their units.
- RA29 To do graphic representations of sinusoidal functions.
- RA27 To know the maximum power transfer theorem and apply it to the other theorems.
- RA48 To do a full analysis of sinusoidal steady-state circuits.
- RA45 To establish the concept of impedance.
- RA12 To link the basic concepts of electromagnetism and electric circuits.
- RA30 To do calculus of phase change in sinusoidal functions.
- RA44 To establish the concept of phasor.
- RA50 To apply Norton's, Thevenin's and the maximum power transfer theorem theorems and the concept of impedance adaptation to the circuit analysis in sinusoidal steady-state.
- RA1122 To do measurements of current and voltage varying with time.
- RA1123 To establish the concepts of generated power and consumed power.



Further reading and supplementary materials

- "Fundamentos de circuitos eléctricos". Quinta edición. C. K. Alexander, M. N. O. Sadiku. Ed. McGraw-Hill. 2013/2018
- "Circuitos eléctricos" Séptima edición. J. W. Nilsson, S. A. Riedel. Ed. Pearson Prentice-Hall. 2005
- "Análisis de circuitos en ingeniería". Séptima edición. W. H. Hayt, Jr., J. E. Kemmerly, S. M. Durbin. Ed. McGraw-Hill Interamericana. 2007
- "Análisis básico de circuitos en ingeniería" Sexta edición. J. D. Irwing. Ed. Prentice-Hall.
- Moodle.
- PC, oscilloscope, function generator, multimeter, power supply.