Palestine Polytechnic University
College of Engineering
Department of Mechanical Engineering
Analysis of Electrical Circuits

Course name:
- Analysis of Electrical Circuits.

Course number
- ECE 215 (Registration Code: 5090)

E-Class
- Google classroom code: `cpk2lyl`

Credits and contact hours
- 3 Credit Hours

Lecture	*Lab.*	*Project*	*HW*	*Exam*	*Tutorial*	*Other*	*Total*
38	0	0	60	10	10	10	128

Class meetings
- Monday and Wednesday 08:00-09:15. Wad Elharye B316.

Office hours
- Sunday and Tuesday and Thursday 09:00-10:00, 11:00-12:00
- Monday and Wednesday 09:30-11:00
- Tuesday 12:00-14:00

Instructor details

Name	*Contact*	*Office*
Dr. Jasem Tamimi	jtamimi@ppu.edu	B209

Textbook information

Course main reference
- Nilsson, J., and Riedel, S. Electric Circuits. Prentice Hall, 10th Ed., 2015.

Course supplemental material
- Dorf, R. C. and Svoboda, J. A. Introduction to Electric Circuit. 7th Ed, 2014.
- Irwin, D. and Nelms, R. Basic Engineering Circuit Analysis, 11th Ed, 2015.
- Alexander, C. and Sadiku M. Fundamentals of Electric Circuits, 5th Ed, 2012.

Course specific information

Catalog description 2016-2017
- Circuit variables, balancing power, voltage and current, the ideal basic circuit element, power and energy, voltage and current sources, electrical resistance (Ohms law), Kirchhoffs laws, resistors in series, resistors in parallel, the voltage-divider and current-divider circuits, measuring voltage and current, delta-to-wye equivalent circuits, node-voltage and mesh-current methods, source transformation, Thvenin and Norton equivalents, maximum power transfer, superposition. The inductor and capacitor and their series-parallel combinations. The natural and step responses of an RL and RC circuits.

Prerequisites
- Physics II, 4068 (SC 123).

Co-requisites
- None.

Specific goals and assessment

Specific outcomes of instruction

No.	*Course ILOs*	*SOs*	*100%*
1	1. Be able to use the definitions of, voltage, current, power and energy with the passive sign convention. 2. Be able to state Ohms law and Kirchhoffs current law. Be able to use the equations for voltage, current, power, and energy in an inductor as well as to combine inductors capacitors with initial conditions in series and in parallel.	***a***	10%
2	1. Be able to analyze the circuit with independent voltage and current sources, dependent voltage and current sources, as well as resistors. 2. Be able to use Ohms law, Kirchhoffs current law, and Kirchhoffs voltage law to analyze simple circuits and calculate the power for each element electric network. 3. Analyze electric network involving series, parallel, series-parallel, delta, wye and delta-wye resistors and use voltage- and current- divider rules. 4. Understand the concept of the Thvenin and Norton equivalent circuits as well as maximum power transfer theorems and be able to construct a Thevenin or Norton equivalent for a circuit. 5. Be able to determine and analyse the natural response of both RL and RC circuits with impulse and step inputs.	***e***	65%
3	Be able to use the node-voltage and mesh-current methods as well as doing the desired source transformation to solve a circuit.	***c***	25%

Course outcomes assessment methods

No.	*Assessment method*	*100%*
1	First exam, 7^{th} Week, Provisional	20%
2	Second exam, 12^{th} Week, Provisional	20%.
3	Quizzes and HWs	10%.
4	Final Exam	50%.

List of covered topics

No.	*Topics*	*Hours*
1	Chapter 1: Circuit Variables: Sections 1.1 to 1.6	2
2	Chapter 2: Circuit Elements: Sections 2.1 to 2.5	6
3	Chapter 3: Simple Resistive Circuits. Sections 3.1 to 3.7	8
4	Chapter 4: Techniques of Circuit Analysis. Sections 4.1 to 4.13	10
5	Chapter 6: Inductance, Capacitance, and Mutual Inductance: Sections 6.1 to 6.4	6
6	Chapter 7: Response of First-Order RL and RC Circuits. Sections 7.1 to 7.6	6

Additional Information

Contribution to professional component

No.	*Component*	*Credits*
1	Mathematics and science	0
2	Engineering and science	3
3	General education requirements	0
4	Major design experience	0

Data used to show student proficiency in the course outcomes

No.	*Data*
1	Samples of Student work
2	Grade sheet showing student performance and class average in ILOs
3	Final exam

Policies

No.	*Policy*
1	Attendance check will be done through attendance check-list, so please sign it with your original signature each class and do not sign instead of any other colleague. All students who use fake signatures will be penalized.
2	Please do not attend the class if you are late with more than 15 minutes.
3	Students with more than **6 missed hours** will have "**WF**" grade in the course.
4	**Only** a persuading excuse can be accepted for a missed exam.
5	Using or playing with mobile phones during the classes are **not** allowed.

Teaching methods

No.	*Method*
1	Lectures: The concepts, theorem with their proofs and interpretation, circuit-solving techniques,... will be explained using simple class materials, e.g., blackboard and pen. Then problems and case studies will be solved using blackboard and pin in the class by the teacher, these problems are entitled with "Examples", other problem will be solved by the student in the class these problems are entitled with "Exercise". The in Class quizzes can be also solved within groups in the lecture.
2	Assignments: Student must solve and hand out some selected problems in the textbook in a specified deadline.