Palestine Polytechnic University
College of Engineering
Department of Mechanical Engineering
Applications in Circuits and Electronics

Course name:
- Applications in Circuits and Electronics.

Course number
- ECE 315 (Registration Code: 5092)

E-Class
- Google classroom code: `05j7y2c`

Credits and contact hours
- 3 Credit Hours

Lecture	*Lab.*	*Project*	*HW*	*Exam*	*Tutorial*	*Other*	*Total*
38	42	0	75	10	10	10	185

Class meetings
- Sunday, Tuesday and Thursday 08:00-09:50. Wad Elharye B303.

Lab meetings
- **Section 1**: Sunday 11:00-14:00. Wad Elharye B202.
- **Section 2**: Thursday 11:00-14:00. Wad Elharye B202.
- **Section 3**: Wednesday 14:00-17:00. Wad Elharye B202.

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

Instructors details

Name	*Contact*	*Office*
Dr. Jasem Tamimi	jtamimi@ppu.edu	B209
Eng. Zaher Saafin	zahersaafin_eng@ppu.edu	B202

Textbook information

Course main reference
- Nilsson, J., and Riedel, S. Electric Circuits. Prentice Hall, 10th Ed.
- Floyd, T. Electronic Devices, Prentice Hall, 9th Ed.
- Buchla, D. Experiment in Electronics Fundamentals and Electric Circuits Fundamentals. Prentice Hall, 4th Ed.

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.
- Berlin, H., Experiments in Electronic Devices, 3rd Ed. 1993.

Course specific information

Catalog description 2016-2017
- **Courseware:** AC networks and phasors. Three-phase networks. AC power. Operational amplifier. Network (active and passive) using Laplace and inverse Laplace transforms. Frequency response of passive and active filters, Active and passive filter design. Oscillators.

- **Labware:** Experiments in electrical network analysis that demonstrate the knowledge of the main theorems of dc and ac network, e.g., Ohm's law, Kirchhoff law , Thivenen and first order circuits. In addition, experiments that demonstrate the knowledge of microelectronic devices, e.g., rectifiers , transistors (BJT and FET) op amps, active filters and oscillators.

Prerequisites

- Applied Electronics, ECE 314 (5091).

Co-requisites

- None.

Specific goals and assessment

Specific outcomes of instruction

No.	*Course ILOs*	*SOs*	*100%*
1	Transform and analyze a single- and three- phase circuits with ac sources using phasor concepts and different network theorems.	***e***	27%
2	Analyze circuits containing ideal op amps, and recognize inverting amplifier, summing amplifier, non-inverting amplifier, and difference amplifier.	***e***	10%
3	Analyze ac electrical networks in terms of ac power concepts, namely, instantaneous power, average power, reactive power, complex power and power factor.	***e***	10%
4	Analyzing passive and active circuits using Laplace and inverse Laplace transforms.	***e***	15%
5	Analyze oscillators as well as active filter circuits to achieve a desired frequency response.	***e***	5%
6	Lab outcomes	***b***	33%

Course outcomes assessment methods

No.	*Assessment method*	*100%*
1	First exam, 7^{th} Week, Provisional	14%
2	Second exam, 12^{th} Week, Provisional	14%.
3	Quizzes and HWs	7%.
4	Lab work (report+activties+final)	33%.
5	Final Exam	32%.

List of covered topics

No.	*Topics*	*Hours*
1	Text 1, Chapter 9: Sinusoidal Steady-State Analysis. Sections 9.1 to 7.12	9
2	Text 1, Chapter 10: Sinusoidal Steady-State Power Calculations. Sections 10.1 to 10.6	6
3	Text 1, Chapter 11: Balanced Three-Phase Circuits^0. Sections 11.1 to 11.6	3
4	Text 1, Chapter 5: Operational amplifier: Sections 5.1 to 5.6	3
5	Text 1, Chapter 12: Introduction to the Laplace Transform: Sections 12.1 to 12.9	3
6	Text 1, Chapter 13: The Laplace Transform in Circuit Analysis. Sections 13.1 to 13.7	5
7	Text 1, Chapter 14: Introduction to frequency domain. Sections 14.1 to 14.5	4
8	Text 1, Chapter 15: Active Filter Circuits. Sections. 15.1 to 15.3	3

	9	Text 2, Chapter 16: Oscillators. Sections 16.1 to 16.4	2
	10	Text 3, Experiments 5 through 44 (will be detailed by the lab supervisor)	42.

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	Lab reports and activities.
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.
6	**Lab policies**: You have to completely follow the all lab instructions that are given from the lab supervisor or the teaching assistant.

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	Single Assignments: Student must solve and hand out some selected problems in the textbook in a specified deadline.
3	Groups' Assignments: The class will be divided into groups (each group 2-3 students), each group will have several tasks concerning the electrical circuit network.