Course number: 0402212, 04022230
Course: Name: Electric Circuits 2
Prerequisites by course: Electric Circuits 1, 0402211, 04022130
Prerequisites by topic: thorough understanding of circuits analysis techniques such as nodal and mesh analysis, Thevenin and Norton theorems, and delta-y transformations. General solution of second order linear ordinary differential equations. Complex numbers calculations.
Credit hours: 3
Contact hours: 3
Textbook: [Fundamentals of Electric Circuits], [Charles Alexander, Mathew Sadiku], [Fourth Edition, 2009].
References: [Theory and Problems of Electric Circuits], [Mahmoud Mahvi, Joseph A. Edminister], [Fourth Edition, Schaum's Outline Series, Mc Graw-Hill, 1997].
Course website (Prof. Walid Emar):
https://www.youtube.com/playlist?list=PLKWJbbrMdZqteSEfTnd0nvBOgP9nT_MUh
Schedule and duration: 16 weeks, 14 lectures (including exams and hand reports and projects)
Minimum student material: Textbook, Class handout, Personal PC, Internet, Calculators.
Minimum college facilities: Library, computational facilities, PC Labs, Internet.
Course objectives: The overall objective of this course is to provide the student with the knowledge and proficiency to

Analyze 1-phase, 3-phase, and mutually coupled circuits.
Determine the parameters of RLC circuits.
Analyze the resonant circuits and frequency response.
Design and simulate the alternating current wave types.
Calculate alternating current electric quantities.
Study the magnetic circuits and transformers.

Course outcomes and relation to ABET student outcomes: (matrix)

Course Outcomes	Student Outcomes						
	SO1	SO2	SO3	SO4	SO5	SO6	SO7
Electric circuits main concepts, Alternating current wave's types, Electrical circuit theorems applications, Three-phase systems	x	x					
Determining series and parallel circuits' parameters, Analyzing electric circuits, AC power and energy, voltage, and current phasors.	x	x					
Analyzing the frequency response of AC circuits, Analyzing the magnetic circuits.	x	x					
Studying and analyzing equivalent AC circuits, Studying and analyzing bridge circuits, Implementation of network theorems.	x	x					
Determine resonant frequency, quality factor and bandwidth of a network. Characterize networks by admittance, impedance. Understand mutual and self-inductance and analyze circuits containing linear and ideal transformers.	x	x					

Topic Outline and Schedule:

Week	Topics	Chapters in Text
1-2	The RLC Circuit	CH8
2-3	Sinusoids and Phasors	CH9
4-5	Sinusoidal Steady-State Analysis	CH10
6	AC Power Analysis	CH 11
7-8	Three Phase Circuits	CH12
9-10	Magnetically Coupled Circuits	CH13
11-12	Frequency Response	CH14
13-14	Two-Port Networks	CH18

Computer usage: Faculty PC and Personal Laptop

Attendance: A- **Attendance is mandatory.** Students are required to attend all lectures, attendance rules and regulations will be strictly applied

B- In case of missing any exam, sufficient documentation of the reason should be provided to the instructor for approval. In case of approval, faculty's make up exam policy will be followed.

Assessments:

- All exams will be closed book and notes.
- The only calculator allowed for use in this course are those permitted according to Faculty of Engineering standards.
- Mobile phones are strictly not allowed to be used within classroom for any means.
- Cheating during exams, plagiarism, and unauthorized collaboration with colleagues in solving assignments will not be tolerated.

Grading policy:

- 20% Assignments (All assignments are posted online through the e-learning system)
- 30% Midterm Exam
- 50% Final Exam

Instructor: Dr. Osama Fares

Class time and location: Sun, Tues, Thur: 12:00 – 1:00 pm, Networks Lab.

Student Outcomes (SOs)

An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
An ability to communicate effectively with a range of audiences
An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
An ability to acquire and apply new knowledge as needed, using appropriate learning strategies