Zarqa University
Faculty of Engineering Technology
Mechanical Engineering Department

Course Information	0904211
	Electrical Circuits(1)

3 Credits	Compulsory	Fall 2014

	Prerequisites by Course: 0904211 Electrical Circuits(1)
	Co-requisites by Course: -
	Prerequisites for: Electrical Circuits(2)
	Schedule: Lecture, 8:00-9:50, m,w L315
Instructor	Prof assistances. Dr. Eng Wasif Al Saluos
Contact Information	mabuhilal@zu.edu.jo, Office L333, Phone: 05-3821100-
Office hours	10:00-11:00, STTH; 8:00-9:30, MW, or by appointment
Textbook	(1)William H.Hayt, and Jack E.Kemmerly,Stevon M.Durbin, Engineering circuits analysis, sixth edition, McGraw-hill, 2001.
References and Resources	1. J.W.N Nilsson, electric circuits, fourth edition, addison-wesly, 1993. 2. Robert L.Boylestad, Introductory circuit analysis prentice Hall International, Inc.1997. 3. J.D.Irwin, Basic engineering circuit analysis, 2d edition, Macmillan, 1987. 4. T.L.Floyd, principles of electrical circuits, Merrill publishing Co.1995.

Evaluation Criteria	Activity	Percent (%)
	Quizzes and Homework	10
	First Exam	20
	Second Exam	20
	Project	-
	Final Exam	50

Catalog Description	Circuit analysis and network theorems: Kerchief's laws, Voltage divider, Current divider, Wheatstone Bridge, analysis of circuit containing dependant sources, Nodal analysis, mesh analysis, superposition, source transformations, Thevenin and Norton theorems, maximum power transfer, wetston Bridges, star and delta connection and transfer. Inductance and capacitance, RL, RC and R_L_C circuits, Resonance circuit (tank circuit), Sinusoidal forcing function, phasor diagrams, rectangular form, average and rms values.
Course Objectives	**-**Understanding: Passive and active components of electrical

	networks. Use of mesh analysis, nodal analysis, Thevenins theorem and Norton's theorem in circuit analysis. The different transient response of RL, RC and RLC circuits. The steady state impedance of resistor, capacitor and inductor. -Knowledge: Circuit laws, including Kirchhoff's current and voltage laws; Thevenin's and Norton's Theorem; the principle of superposition .Use differential equations to analyze the transient response of first order and second order circuits. -Skills: Analysis of circuits with independent and dependent sources. Calculation of response time for RL, RC and RLC circuits. Reduction simple dc circuits to their Thevenin and Norton equivalents. Applicatio nodal and mesh analysis and the principle of superposition.	
Intended Learning Outcomes	**Course Outcome**	**[%]**
	Students will gain basic knowledge about the fundamentals of electrical engineering in the area of circuit analysis.	40%
	-Students; will develop their basic skills of problem solving and critical thinking by learning techniques such as nodal, mesh analysis and network theorems.	30%
	- Students will develop the ability to choose between various approaches to solve difficult problems.	15%
	-Students will learn to use, or demonstrate that can use advanced software perform circuit analysis	15%
Relationships to Program Outcomes	a Ability to apply knowledge of mathematics, science, and engineering (H) c Ability to design a physical system (M) e Ability to identify, formulate, and solve electrical engineering problems (H) k Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (L)	
Relation to Program Educational Objectives		
Contribution to the Professional Components	Mathematics and Basic Sciences	-

	Engineering Topics	Engineering Sciences	90%
		Engineering Design	10%
	General Education		-

Course Outline	Subject	Hours
		18

	Introduction. Circuit analysis and network theorems: Kerchief's laws, Voltage divider, Current divider, analysis of circuit containing dependant sources, Nodal analysis, mesh analysis, superposition, source transformations, Thevenin and Norton theorems, maximum power transfer, star and delta connection and transfer. **Exam I (up to end of week 5**	2
		12
	Inductance and, RL, capacitance and RC R_L_C circuits, Resonance circuit (tank circuit),	
	Second II (up to end of week 11	2
	Filter circuits Sinusoidal forcing function, phasor diagrams, rectangular form, average and rms values	8
	Review, Final Exam	2
Policies:	**Attendance** Attendance will be checked each class. *Students are expected to attend each lecture*. University regulations will be strictly followed for students exceeding the maximum number of absences. **Homework** - Homework assignments are due at the beginning of class the day they are due. - No late homework will be accepted unless prior arrangement have been made with the instructor - *No make-up allowed on homework.* - You can consult each other regarding homework solution s however each assignment must be your own solution. Verbatim or duplicates assignments will be *regarded as cheating*. **Class participation and behavior** - Classroom participation is a part of learning; it is only by asking questions and talking through ideas that you can come to fully understand the material - Please do not engage in behavior which detracts from the ability of other students to learn. Such behaviors include arriving at class late, speaking or whispering while the instructor and students are discussing ideas or asking questions, reading messages newspapers in class, cell-phones ringing, etc.	

Course Outline

Week	Date	Topic/ Experiment
1	13/10/2014	Introduction, Series and parallel
2	20/10/2014	Kercheefes law and branches
3	27/10/2014	Nodel and Mesh thearom
4	3/11/2014	Thevenin analysis
5	10/11/2014	Norten analysis
6	17/11/2014	Super position and first exam
7	24/11/2014	Power max and star delat transfer circuits
8	1/12/2014	Capacitors and RC circuit
9	8/12/2014	Induction and RL circuit
10	15/12/2014	RLC circuits
11	22/12/2014	Second exam
12	29/12/2014	Resonance circuits
13	5/01/2014	filters
14	12/01/2014	AC systems
15	19/01/2014	Revision
16	26/01/2014	Final Exam