Course Specifications

Course Title:	Circuit theory
Course Code:	**CEN2310**
Program:	**Computer and Network Engineering**
Department:	**Computer Engineering Department**
College:	**College of computers and information systems**
Institution:	**Umm Al-Qura University**

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Table of Contents

A. Course Identification

1. Credit hours: 5	

2. Course type

a. University ☐ College ☐ Department ☑ Others ☐

b. Required ☑ Elective ☐

3. Level/year at which this course is offered: Level 6/ Year 2

4. Pre-requisites for this course (if any)**:**

N/A

5. Co-requisites for this course (if any)**:**

N/A

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	80	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	40
2	**Laboratory/Studio**	40
3	**Tutorial**	
4	**Others** (specify)	
	Total	

B. Course Objectives and Learning Outcomes

1. Course Description

This course takes a detailed look at the electric circuit laws, rresistance equivalent circuits, circuit analysis techniques, first order circuit analysis and RLC circuit.

2. Course Main Objective

- Define and explain basic circuits laws
- Comprehension of circuit structure
- Analysis of different circuit theorems
- Synthesis of transient response of first order networks
- Application of resonant circuits

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and understanding**	
1.1	Knowledge of basic circuit concept	K1
1.2	Synthesize of resistive networks, resistive networks, circuit structure	K1
1.3	Analyzing direct application of Ohm's and Kirchhoff's laws, storage elements, nodal and mesh analysis, linearity and superposition, network theorems and network reduction	K2
1.4	Application of transient response of first order networks, resonant circuits.	K2
2	**Skills:**	
١,٢	Ability to solve numerical problems	S1
٢,٢	Ability of deduction and inference	S3
٣,٢	Ability to analyze different electric circuits	S2
3	**Values:**	
3.1	Understand and communicate to others the importance and relevance of statistics in the modern world	V2
3.2	Be an independent learner, able to acquire further knowledge with some guidance or support	V1
3.3	Manage time and meet deadlines	V1

C. Course Content

No	List of Topics	Contact Hours
1	Basic circuit variables	4
2	Circuit elements	8
3	Circuit laws	8
4	Resistance equivalent circuits, resistors in series and parallel, voltage and current dividers, dependent sources	16
5	Circuit analysis techniques	20
6	Inductance, capacitance, mutual inductance	4
7	First order RC and RL circuits, sinusoidal steady-state analysis, and power.	16
8	Introduction to RLC	4
Total		

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Knowledge of basic circuit concepts	Classroom lectures, power point slides and individual attention is used to develop knowledge of the course.	1. Exercises & Home works, Quizzes, Midterm,,Final Exam 2. Review outputs from the assignments in the computer lab and from their assignments.
1.2	Synthesize of resistive networks, resistive networks, circuit structure		
1.3	Analyzing direct application of Ohm's and Kirchhoff's laws, storage elements, nodal and mesh analysis, linearity and superposition, network theorems and network reduction		
1.4	Application of transient response of first order networks, resonant circuits.		
2.0	**Skills**		
2.1	Ability to solve numerical problems.	1. Assignments. 2. Labs	1. Mid and Final Exams 2. Labs Exams
2.2	Ability of deduction and inference.		
2.3	Ability to analyze different electric circuits		
3.0	**Values**		
3.1	Understand and communicate to others the importance and relevance of statistics in the modern world.	1. Numerical Assignments 2. Labs 3. Students Presentations 4. Practical hardware problems to enable students to understand the components	1. Mid and Final Exams 2. Labs Exams.
3.2	Be an independent learner, able to acquire further knowledge with some guidance or support.		
3.3	Manage time and meet deadlines		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	4,9	10
2	Mid Term	5,10	20
3	Assignments	Throughout semester	5
4	Lab	Throughout semester	25
5	Final Exam	12	40
6			

#	Assessment task*	Week Due	Percentage of Total Assessment Score
7			
8			

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

For individual student consultations and academic advice teaching staff is expected to be available
    8 hours per week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Nilsson & Riedel "Electric Circuits", 10th Edition, Pearson, 2015.
Essential References Materials	Robert Boylestad, "Introductory Circuit Analysis", 12th Edition., Pearson, 2014.
Electronic Materials	i. http://utwired.engr.utexas.edu/rgd1/ ii. http://www.irf.com/technical-info/guide/circuit.html iii. http://www.circuit-magic.com/laws.htm iv. http://www.zen22142.zen.co.uk/adt.htm v. http://www.physics.uoguelph.ca/tutorials/ohm/
Other Learning Materials	National Instruments Multisim 11.0 is required.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	1. A Lecture room having Multimedia projector for lectures and students' presentation. 2. Well-equipped lab with kits for practical implementations of electronic circuits 3. Internet
Technology Resources (AV, data show, Smart Board, software, etc.)	1. Computer lab available for practical networking and for simulations. 2. Students are encouraged to bring in their laptops and use them in solving problems in the classroom.

Item	Resources
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	National Instrument Elvis Boards with computers and components are required

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	Students	Course Survey and students Feedback for each learning outcome of the course.
Extent of achievement of course learning outcomes	The instructor or the Department	1. Faculty meetings to discuss best practices and issues related to the course 2. Comparison of the course content with similar courses offered in other colleges 3. Updating course curriculum according to latest research done in the field

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	