

Ministry of Higher Education and Scientific Research

Supervision and Scientific Evaluation Body

Quality Assurance and Academic Accreditation Office

## Course Description Sample

**Subject:** Foundations of Electrical Engineering

This course description provides a brief survey of the most important characteristics, expected learning output, showing whether students have made full use of the learning opportunities. These characteristics have to be matched with the description of the program.

1. Educational Institution	Shatt Al-Arab University College
2. Department / Center	computer technology engineering
3. Course Title /Code	FUND 9104/ Foundations of Electrical Engineering
4. Lecturer Name	Weekly/2 theory + 1 practice + 3 practical
5. Type of Teaching	midterm
6. Academic Year /Term	180 hours / every week 6 hours
7. Total No. of Teaching Hours	7/11/2022
8. Date of Preparing this Course Description	Shatt Al-Arab University College

### 9. Course Objectives

A- Cognitive goals
A1- Knowing the basics of electronic circuits, distinguishing all the physical components and their work, and knowing the basic principles.
A2- Solving complex electronic engineering problems through the use of technology and deduction of alternative parts
A3- Understand the engineering principles of the interconnection process, such as parallel and series with the power transmission process
A4- Calculation of voltage, current and power in all electrical circuits

A5- Distinguish the types of pieces and indicate how to draw them and know the capacity of each piece such as resistors, capacitors, etc.
---

A6- Calculates the power consumed in the circuit, the power derived from the source, and the maximum power transferred to the load
--

## 10. Course Output, Methodology and Evaluation

### (A) Cognitive Objectives

B - Skills objectives of the course
-------------------------------------

B1 - Identify complex problems in electronic circuits and determine how to solve them.
--

B2 - Applying engineering analysis and knowing the appropriate voltage and current for each electronic part
---

B3 - Knowledge of measuring devices and training in them, with knowledge of electronic parts and the differences between them
---

B 4- Linking the theoretical aspect with discussions and how to use tools to extract electronic circuits that are not available and cannot be obtained in the labor market
--

B - Skills objectives of the course
-------------------------------------

### (B) Skill Objectives Related to the Program:

a. Scientific Skills
----------------------

b. Leadership Skills
----------------------

c. Skills Related to Administrative Work Challenges
---

## Methods of Teaching and Learning

Study lectures
----------------

Discussions between different student groups on the application of theories and basics of electricity and the use of various electrical devices available to understand the components of materials
---

Establishing workshops and theoretical presentation on how to use the basics of engineering to build simple and complex electrical and electronic circuits
--

The use of multiple means to increase understanding and clarification through engineering analysis and to prove it through the devices available in the laboratory
--

Extra-curricular discussions and assignments to increase understanding in applications and electronic circuits
--

## Methods of Evaluation

Semester exams and periodic process
Quizzes
Other extra-curricular exams
Semester exams and periodic process

### (C) Sentimental and Value Objectives

C- Emotional and moral goals
C1- Enhancing thinking and planting the responsibility of the engineering profession
C2 - Using the basics of engineering and computers to support the country's economy and infrastructure development.
C 3- Respect for self and others through discussions aimed at improving engineering and technical skills with full knowledge of the latest various programs
C4 - Developing modern engineering techniques and skills and the tools necessary to practice the engineering profession, while thinking about using available technologies to produce electronic circuits that are not available or alternative.
C- Emotional and moral goals
C1- Enhancing thinking and planting the responsibility of the engineering profession
C2 - Using the basics of engineering and computers to support the country's economy and infrastructure development.

### Methods of Teaching and Learning

☐ Theoretical presentation of the curriculum vocabulary, its importance and use, with realistic examples.
☐ Theoretical application in the laboratory with a full explanation of the set of tools used and the measurements.
☐ Classroom group discussions for practical and practical examples.

### Methods of Evaluation

Daily exams of all kinds
The duties assigned to the student
Discussion among students and identifying good students
Reports and Studies

**D) General and Qualitative Skills (other skills related to the ability of employment and personal development)**

D - Transferred general and qualifying skills (other skills related to employability and personal development).
D1- Communication skills and the correct delivery of information using the basis of electricity with mathematical proof
D2- Analysis and investigation of every physical component to achieve the correct analysis of the electronic circuit
D 3- Using modern technology and tools necessary to practice the engineering profession

**11. Course Structure**

<b>Week</b>	<b>No of Hours</b>	<b>Required Learning Output</b>	<b>Title of Subject</b>	<b>Teaching Method</b>	<b>Evaluation</b>
1	2 hours + 1 workout per week	understanding the material	Symbols And Abbreviations, Units, Electric Circuit & It's Element.	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
2	2 hours + 1 workout per week	understanding the material	The Direct Current Network. Kirchhoff's Laws & Their Use In Network Analysis.	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
3	2 hours + 1 workout per week	understanding the material	Series Circuits, Parallel Circuits, Series-Parallel Circuits , Open and Short Circuits, Source Transformation	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
4	2 hours + 1 workout per week	understanding the material	Conversion Of Delta To Star Connection And Vice Versa.	Theoretical lectures (general	Assessment varies according to assessment

				engineering principles and rules) + practical	methods; achievement test + class assignment
5	2 hours + 1 workout per week	understanding the material	Nodal Voltage Method	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
6	2 hours + 1 workout per week	understanding the material	Loop (mesh)Current Method.	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
7	2 hours + 1 workout per week	understanding the material	Superposition Method	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
8	2 hours + 1 workout per week	understanding the material	Thevenin's Theorem	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
9	2 hours + 1 workout per week	understanding the material	Norton's Theorem	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
10	2 hours + 1 workout per week	understanding the material	Maximum Power Transfer Theorem	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment

11	2 hours + 1 workout per week	understanding the material	Reciprocity Theorem	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
12	2 hours + 1 workout per week	understanding the material	The Alternating Current Network Types of Alternating Waveforms, Generation of Alternating Current, and Definitions related to Alternating Waveforms.	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
13	2 hours + 1 workout per week	understanding the material	The Mean Values of Current and Voltage	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
14	2 hours + 1 workout per week	understanding the material	The Effective Vales of Current and Voltage	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
15	2 hours + 1 workout per week	understanding the material	Circuit Elements in the Phasor Domain	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
16	2 hours + 1 workout per week		The Vector Diagram	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment

17	2 hours + 1 workout per week		Reviews for Complex Numbers and there mathematical operations <sup>th</sup>	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
18	2 hours + 1 workout per week		Series and Parallel Ac Circuits	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
19	2 hours + 1 workout per week		The Instantaneous Power and Mean Power of AC, Reactive and Apparent Power	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
20	2 hours + 1 workout per week		Using Kirchhoff's law's to solve AC circuits	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
21	2 hours + 1 workout per week		Using Loop's method to solve AC circuits	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
22	2 hours + 1 workout per week		Using Superposition's method to solve AC circuits	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
23	2 hours + 1 workout per week		Using Thevenin's theorem to solve AC circuits	Theoretical lectures (general engineering principles	Assessment varies according to assessment methods; achievement

				and rules) + practical	test + class assignment
24	2 hours + 1 workout per week		Using Norton's theorem to solve AC circuits	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
25	2 hours + 1 workout per week		3- Phase Current, 3- Phase System, Y- Connection Delta Connection.	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
26	2 hours + 1 workout per week		Solving 3-phase networks with balanced loads, Solving 3-phase networks with unbalanced loads	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
27	2 hours + 1 workout per week		Electromagnetism, Permanent and artificial Magnets, The Magnetic Field, The flux density , The magnetic reluctance , The permeability , The mmf , The magnetic force , The electromagnetic circuits.	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
28	2 hours + 1 workout per week		The implementation of B-H curves for solving electromagnetic circuits	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment
29	2 hours + 1 workout per week		Transformers , The hysteresis losses , The eddy current losses	Theoretical lectures (general engineering	Assessment varies according to assessment methods;



				principles and rules) + practical	achievement test + class assignment
30	2 hours + 1 workout per week		Direct Current Machines, Direct Current Generators, Asynchronous And Synchronous Machines.	Theoretical lectures (general engineering principles and rules) + practical	Assessment varies according to assessment methods; achievement test + class assignment

**12. Infrastructure**

a. Textbooks	*Boylestad, R. L. " Introductory Circuit Analysis", 4th Edition, Charles E. Merill Publishers.
b. References	*Alexander C. K. and Sadiku M. N. "Fundamentals of Electric Circuits", McGraw- Hill Companies. *Alexander C. K. and Sadiku M. N. " Circuit 2nd Edition, Analysis, Theory and Practice", Robbins & Miller. *B.L Theraja, " A Text Book of Electrical Technology" ,4th Edition.
c. Recommended books and periodicals (journals, reports, etc.)	
d. Electronic references, internet websites, etc	

**13. The Plan of Improving the Course**

<p>Adding vocabulary to the curricula within the development of the course at a rate not exceeding 5%</p> <p>Adding new and modern resources and adding videos to facilitate the learning process</p> <p>The inclusion of periodic seminars by external professors</p>
--

