Ministry of Higher Education and Scientific Research

Supervision and Scientific Evaluation Body

Quality Assurance and Academic Accreditation Office

Course Description Sample

Subject: ---- Digital electronics ----------

This course description provides a brief survey of the most important characteristics, expected learning output, showing whether students have made full use f 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	Digital electronics /FUND 9106
4. Lecturer Name	Ayad Mohammed Jabbar
5. Type of Teaching	Attendance
6. Academic Year /Term	Midterm
7. Total No. of Teaching Hours	150 hours
8. Date f Preparing this Course Description	1/9/2021

9. **Course Objectives**

a. Providing students with the most important principles and basics of programming logic and explain how it works and use it in computers and electronic circuits
b.Teaching students how to apply electronic circuit analysis and simplification
c. Providing graduates with the necessary knowledge on the basic knowledge and understanding of arithmetic operations and numerical systems that will be used in the future job in organizations.

e. Providing graduates with the skills of education and creative learning.
f. Using the laws of Boolean algebra.
g. The design of the main and secondary logic gates and their work statement and how to design and output their circuits.
h- Use the study circuit and flip-flop and understand the theories that can be used.

10. **Course Output, Methodology and Evaluation**

(A) **Cognitive Objectives**

a. Enabling students to acquire knowledge and the art of cognitive goals
b. Acquainting students with how to promote their personal knowledge.
c. Helping students to acquire knowledge in the art of Understand the basic principles of logic gates.
d. Discovering and analyzing circuits with their simplification.
e. Knowledge of computing operations between several systems and how to convert between them.
f. Helping students to get the necessary knowledge about the basic principles of harmonic and series circuits

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

a. Learn the several systems and know how to convert between them
b. Learn and analyze logic circuits with simplification of circuits with a truth table
c. Learn the laws of algebra and memory circuits

Methods of Teaching and Learning

a. Explanation and clarification through periodic study lectures
b. Using up-to-date data shows about the application and theories in computers and electronic circuits.
c. Use the theories and the basics of operations in several systems in the laboratory using electronic circuits

d. Adopting group discussions with extra examples.

Methods of Evaluation

a. Oral tests
b. Monthly tests
c. Daily quizzes
d. Students' Regular Attendance

(C) **Sentimental and Value Objectives**

a. Realizing ethical objectives and emotional goals
b. Commitment to university traditions and enhancing thinking and planting the responsibility of the engineering profession and what are the requirements and duties required of students to be a supportive individual for the country.
c. Compliance with the University Instructions and the Ministry Regulations.
d. Promoting students' personal abilities in educational scopes and how to behave well with others.
e. Urging students to participate in international engineering teams to improve engineering skills

Methods of Teaching and Learning

a. Theoretical presentation of the curriculum vocabulary, its importance and use, with realistic examples
b. Educational guidance lectures and theoretical application in the laboratory with a detailed explanation of the program step by step.
c. Continuous directing.
d. Visiting State and private institutions.
e. Group discussions.

Methods of Evaluation

a. Tests of all kinds, daily and periodic and quarterly theoretical exams.
b. Classroom discussions and commitment to ethics and sublime values.
c. Special marks for class activities.
d. Monthly and quarterly evaluation.

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

a. Transferred general and qualifying skills (other skills related to employability and personal development).
b. Enabling students to apply creative thinking and skills of how to communicate with others.
c. Enabling students to use modern methods of analysis and conclusions to use the analysis and proof.
d. Enabling students to using modern technology in writing engineering report

11. **Course Structure**

Week	No of Hours	Required Learning Output	Title of Subject	Teaching Method	Evaluation
1	2	understanding the material	Number systems (decimal, binary, octal, hexadecimal)	- lectures - case study -discussions	- oral tests -questions
2	2	understanding the material	Number systems (BCD, excess-3, gray code)	- lectures - case study -discussions	- oral tests -questions
3	2	understanding the material	Number systems (conversions, operations, complement's)	- lectures - case study -discussions	- oral tests -questions
4	2	understanding the material	Logic gates (AND, OR, NOT)	- lectures - case study	- lectures - case study

				-discussions	-discussions
5	2	understanding the material	Logic gates (NAND, NOR, XOR, XNOR)	- lectures - case study -discussions	- lectures - case study -discussions
6	2	understanding the material	Logic gates (logic Simplification (Boolean, Demorgan's theorem))	- lectures - case study -discussions	- lectures - case study -discussions
7	2	understanding the material	Karnaugh maps (2-variables, 3-variables)	- lectures - case study -discussions	- lectures - case study -discussions
8	2	understanding the material	Karnaugh maps (4-variables, 5-variables)	- lectures - case study -discussions	- lectures - case study -discussions
9	2	understanding the material	Karnaugh maps (SOP, POS, don't care)	- lectures - case study -discussions	- lectures - case study -discussions
10	2	understanding the material	Arithmetic operations (adder, parallel binary adder)	- lectures - case study -discussions	- lectures - case study -discussions
11	2	understanding the material	Arithmetic operations (subtractor)	- lectures - case study -discussions	- lectures - case study -discussions
12	2	understanding the material	Arithmetic operations (decoder, encoder)	- lectures - case study -discussions	- lectures - case study -discussions
13	2	understanding the material	Arithmetic operations (multiplexer, demultiplexer)	- lectures - case study -discussions	- lectures - case study -discussions
14	2	understanding the material	Arithmetic operations (comparator)	- lectures - case study -discussions	- lectures - case study -discussions
15	2	understanding the material	Arithmetic operations (code conversion)	- lectures - case study -discussions	- lectures - case study -discussions
16	2	understanding the material	Flip-flops (SR latch, D latch)	- lectures - case study -discussions	- lectures - case study -discussions

17	2	understanding the material	Flip-flops (T-latch, J-K F.F)	- lectures - case study -discussions	- lectures - case study -discussions
18	2	understanding the material	Flip-flops (edge triggered)	- lectures - case study -discussions	- lectures - case study -discussions
19	2	understanding the material	Flip-flops (conversion from one type to another)	- lectures - case study -discussions	- lectures - case study -discussions
20	2	understanding the material	Counters (asynchronous)	- lectures - case study -discussions	- lectures - case study -discussions
21	2	understanding the material	Counters (synchronous)	- lectures - case study -discussions	- lectures - case study -discussions
22	2	understanding the material	Counters (decade, up/down)	- lectures - case study -discussions	- lectures - case study -discussions
23	2	understanding the material	Counters (cascade, counter decoding)	- lectures - case study -discussions	- lectures - case study -discussions
24	2	understanding the material	Shift-registers (serial in/serial out, serial in/parallel out, parallel in/ serial out, parallel in/parallel out)	- lectures - case study -discussions	- lectures - case study -discussions
25	2	understanding the material	Shift-registers (bidirectional , shift register counter (Johnson counter, Ring counter))	- lectures - case study -discussions	- lectures - case study -discussions
26	2	understanding the material	Multivibrators (definition, astable, bistable,)	- lectures - case study -discussions	- lectures - case study -discussions
27	2	understanding the material	Multivibrators (monostable, 555 timer)	- lectures - case study -discussions	- lectures - case study -discussions
28	2	understanding	A/D and D/A	- lectures	- lectures

		the material	convertors (R/2R DAC, R/2nR DAC,flash ADC)	- case study -discussions	- case study -discussions
29	2	understanding the material	A/D and D/A convertors (tacking ADC, slope ADC ,successive approximation ADC)	- lectures - case study -discussions	- lectures - case study -discussions
30	2	understanding the material	A/D and D/A convertors (digital ramp ADC,delta sigma ADC)	- lectures - case study -discussions	- lectures - case study -discussions

12.**Infrastructure**

a. Textbooks	Introduction to Digital Logic Design First Edition Digital Logic Design: Learn the Logic Circuits and Logic Design Digital Logic Design 4_{th} Edition
b. References	Digital Fundamentals", Eleventh Edition, Thomas L. Floyd, 2015, Pearson Education, ISBN 13: 978-1-292-07598-3. "Digital Electronics: Principles, Devices and Applications", Anil K. Maini, 2007, John Wiley & Sons, Ltd. ISBN: 978-0-470-03214-5.
c. Recommended books and periodicals (journals, reports, etc.)	
d. Electronic references, internet websites, etc	Digital Circuits - Logic Gates (https://www.tutorialspoint.com/digital_circuits/digital_circuits_logic_gates.htm)

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

a. Studying labor market needs.
b. Be informed of the experiences of other countries in the field of development by including new vocabulary
c. Add new logical circuits