



جمهورية مصر العربية

وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and Scientific Research



المعهد العالي للحاسبات وتكنولوجيا المعلومات  
مدينة الشروق - القاهرة  
شعبة علوم الحاسب

## Course specification

**Course Code:** BS 131

**Course Title:** Electronics

**Academic Year:** /

**Course specification**  
**(BS 131 Electronics)**

**Course Outline**

<b>Faculty:</b>	<i>HICIT- (Higher Institute for Computers &amp; Information Technology-El Shorouk Academy)</i>		
<b>Programme(s) on which the course is given:</b>	Undergraduate program in Computer Science		
<b>Major or minor element of programme:</b>	Compulsory		
<b>Department offering the program</b>	Department of Computer Science		
<b>Department offering the course:</b>	Department of Computer Science		
<b>Level</b>	1st Year – 1st Semester		
<b>Date of specification approval</b>	DD/MM/YYYY		

**Basic Information**

<b>Code:</b>	BS 131	<b>Title:</b>	Electronics
<b>Prerequisites:</b>	-		
<b>Weekly Hours:</b>			
<b>Lecture: 2</b>	<b>Exercise: 2</b>	<b>Practical:</b>	<b>Total: 3 credit hours</b>

**Professional Information**

**Course Aims:**

This course introduces the student to electric and analogue electronic circuit analysis. This course starts with linear circuit's analysis including: - resistors, resistors connection and equivalent resistors, types of power supplies then goes through nonlinear circuit's analysis including:- elements, capacitors, diodes, and transistors with simplified circuit analysis in each case.

**Program ILOs Covered by Course**

<b>Knowledge and understanding</b>	<b>Intellectual Skills</b>	<b>Professional and practical skills</b>	<b>General and Transferable skills</b>
A1,A5,A17,A22	B1,B2,B5,B8	C9,C13	D2,D7,D11

## Intended learning outcomes of course (ILOs)

### a. **Knowledge and Under-Standing:**

- a1. Explain the types of resistors and connections: series, parallel, delta and star.
- a2. Explain the types of power supplies to circuits.
- a3. Discuss Ohm's law.
- a4. Discuss Kirchhoff's laws for current and voltage.
- a5. Understand the concept of diodes operation and in circuit analysis methods.
- a6. Understand the concept of transistors operation and in circuit analysis methods.
- a7. Understand Capacitors and inductors connections and behavior in transient simple RC and RL circuits.

### b. **Intellectual Skills:** Cognitive skills of critical thinking, analysis, synthesis, including:

- b1. Choose the method of circuit analysis based on the type of circuit.
- b2. Analysis of modes of operation by assumptions then verify to non-linear elements.
- b3. Solve simultaneous equations for nodes and loops.
- b4. Synthesis of clearly and precisely analysis of problems.

### c. **Professional and practical skills**

- c1. Compute the Thevenin's and Norton's Equivalent for linear circuits.
- c2. Compute maximum power load resistors.
- c3. Identify the types of resistors and power supplies for circuit diagram.
- c4. Compute the resistors value from the color, or the writing on the resistors.
- c5. Perform linear circuit analysis based on mesh, node, loop, superposition, and reduction.
- c6. Perform circuit analysis for simple circuit containing diodes and transistors.

### d. **General and transferable skills:** Specifically ability to:

- d1. Communicate effectively by oral, written and visual means.
- d2. Work effectively as an individual and as a member of a team.
- d3. Develop creativity and imagination skills, self-assessment ability and critical thinking and analysis ability.

## Contents

Topic	Contact Hours	
	lecture	Ex/Lab
Basic units and their qualifiers	2	2
Ohm's law	2	2
Voltage and Current divider rules	2	2
Delta star transformation	2	2
Kirchhoff's laws and their applications	2	2
System analysis technique (node)	2	2
System analysis technique (mesh analysis & super mesh)	2	2
System analysis technique (superposition)	2	2
System analysis technique (Thevenin and Norton)	2	2
System analysis technique (source transformation) & maximum power transfer.	2	2
Diodes & diodes analysis	2	2
Capacitors	2	2
Transistors & usages	2	2

### Teaching and learning methods

Teaching and learning methods	Used
Lectures	√
Tutorial Exercises	√
Practical Lab	√
Discussions.	√
Self – Learning (Reading material, Websites search,)	
Self-studies	
Group work	
Presentation	
Problem solving/problem solving learning based	√
Case study	√
Synchronous E-Learning	√
Video lectures	√
Asynchronous E-Learning	√

### Student assessment methods & Schedule

Methods	Used	Week#
Midterm Exam	√	<b>8</b>
Final Exam	√	<b>16</b>
Course Project		
Course Work & Quizzes	√	<b>2-14</b>
Practical Exam		

### Assessment Weight

Assessment	Weight %
Mid Term Exam	20
Practical Exam and Project	-
Final Exam	60%
Course Work & Quizzes	20%
Total	100

### Course Work & Quizzes

Short Exams, Assignments, Research, Reports, Presentations
Class/Project discussion

### List of references

<b>Essential books (textbooks)</b>	Michael Tooley BA, (Electronic Circuits: Fundamentals and Applications, 3rd edition.
<b>Course notes</b>	E-Learning Portal
<b>Recommended books</b>	- Stan Gibilisco , Teach Yourself Electricity And Electronics, (3rd edition), 1976. - Mitchel E. Schultz, GROB'S BASIC ELECTRONICS, (11th edition), 2011.
<b>Periodicals, website</b>	
<b>Videos link</b>	<a href="https://www.youtube.com/watch?v=PwHGLgNZgFI&amp;list=PLN8TBH9HIw19oduuJWQUEpQhcBkW-2sR7&amp;pp=gAQBiAQB">https://www.youtube.com/watch?v=PwHGLgNZgFI&amp;list=PLN8TBH9HIw19oduuJWQUEpQhcBkW-2sR7&amp;pp=gAQBiAQB</a>

### Required Facilities

<b>Tools &amp; SW (Technology facilities):</b>	<ul style="list-style-type: none"> <li>- MS project SW Package for schedule projects</li> <li>- MS power point SW package for presentation</li> <li>- MS word SW package for system documentation preparation</li> </ul>		
<b>Teaching facilities:</b>	Whiteboard		√
	Computer Lab		√
	Data show		√
	E-Learning		√
	Videos		√
	Website		√

### Course Content/ILO Matrix

Course Contents	Knowledge & understanding							Intellectual skills				Professional and practical skills						General		
	a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	b4	c1	c2	c3	c4	c5	c6	d1	d2	d3
Basic units and their qualifiers	X										X									X
Ohm's law	X		X								X			X						X
Voltage and Current divider rules	X		X						X		X									X
Delta star transformation	X		X					X			X									X
Kirchhoff's laws and their applications	X			X							X			X						X
System analysis technique (node)								X	X	X	X					X				X
System analysis technique (mesh analysis & super mesh)								X	X	X	X					X				X
System analysis technique								X	X		X					X				X

(superposition)																					
System analysis technique (Thevenin and Norton)										X	X	X	X	X					X		X
System analysis technique (source transformation) & maximum power transfer.										X	X		X		X				X		X
Capacitors		X							X						X				X		X
Diodes & diodes analysis		X				X			X			X			X				X		X
Transistors & usages							X			X									X		X

### Learning Method /ILOs Matrix

Learning Methods	Knowledge and understanding							Intellectual skills				Professional and practical skills						General		
	a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	b4	c1	c2	c3	c4	c5	c6	d1	d2	d3
Lectures	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Tutorial Exercises								X	X	X	X	X	X	X	X	X	X	X		X
Problem solving	X	X	X	X	X	X	X												X	X
Group work																				
Case study	X	X	X	X	X	X	X												X	X
Practical Lab																				
Discussions.								X	X	X	X	X	X	X	X	X	X			

### Assessment Methods /ILOs Matrix

Assessment Methods	Knowledge & understanding							Intellectual skills				Professional & practical skills						General		
	a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	b4	c1	c2	c3	c4	c5	c6	d1	d2	d3
Mid Term Exam	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Final Exam	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Course Project																				
Course Work & Quizzes		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Practical Exam																				

Course / Program ILOs Matrix														
Course ILOs	Prog ILOs	Knowledge & understanding				Intellectual skills				Professional and practical skills		General		
		A1	A5	A17	A22	B1	B2	B5	B8	C9	C13	D2	D7	D11
Knowledge and Understanding	a1	x	x	x	x	x	x	x	x					
	a2	x	x	x	x	x	x	x	x					
	a3	x	x	x	x	x	x	x	x					
	a4	x	x	x	x	x	x	x	x					
	a5	x	x	x	x	x	x	x	x					
	a6	x	x	x	x	x	x	x	x					
	a7	x	x	x	x	x	x	x	x					
Intellectual skills	b1					x	x	x	x					
	b2					x	x	x	x					
	b3					x	x	x	x					
	b4					x	x	x	x					
Professional and practical skills	c1									x	x			
	c2									x	x			
	c3									x	x			
	c4									x	x			
	c5									x	x			
	c6									x	x			
General skills	d1											x		
	d2											x		
	d3												x	x

**Course Coordinator: Dr. Mohamed Mostafa ( )**

**Head of Department: Dr. Ahmed El-Abbassy ( )**

**Date: --/--/2023**