



# Engineering Program

<b>Specialization</b>	<b>Common</b>
<b>Course Number</b>	<b>20301111</b>
<b>Course Title</b>	<b>Electricity and Electronics</b>
<b>Credit Hours</b>	<b>2</b>
<b>Theoretical Hours</b>	<b>2</b>
<b>Practical Hours</b>	<b>0</b>



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

**Brief Course Description:**

Concepts and definitions, electrical circuit elements, voltage, current, resistance, capacitance and inductance, ohms law and dc circuit Calculations. Ac Circuits. Three phase circuits, transformers, and electrical machines. Basic electronic devices and circuits. Introduction to electrical protection.

**Course Objectives:**

1. Defined and study current and voltage sources.
2. Use different theorems for analyzing DC electrical circuit.
3. Study the elements of AC circuit.
4. Study the resonance in AC parallel and series circuit.
5. To familiarize student with classification of electrical machines.
6. To know the structure, principle of operation, characteristic and equations related (Transformers, DC machines, AC machines).



**Detailed Course Description:**

Unit Number	Unit Name	Unit Content	Time Needed
1.	<b>Direct Current Circuits</b>	<ul style="list-style-type: none"> <li>Circuits and circuit elements. Open loop, closed loop and short circuits. Current, voltage, power. Basic calculations. Series and parallel connections of resistors.</li> </ul>	5
2.	<b>Alternating Current Circuits</b>	<ul style="list-style-type: none"> <li>Sine wave voltage. Main characteristics of sine waves. Single-phase and three-phase circuits. Basic calculations. Power factor.</li> </ul>	4
3.	<b>Transformers</b>	<ul style="list-style-type: none"> <li>Basic construction and principle operation of single-phase transformer. Basic relationships between primary and secondary windings.</li> </ul>	2
4.	<b>Electrical machines</b>	<ul style="list-style-type: none"> <li>DC motors and generators. Principle of operation. Construction. Main characteristics.</li> <li>Induction motors: single-phase and three-phase. Construction and basic principle of operation. Main characteristics.</li> </ul>	4
5.	<b>Semiconductor devices</b>	<ul style="list-style-type: none"> <li>Diodes and transistors. Main characteristics, symbols. Basic applications.</li> </ul>	4
6.	<b>Control and protection devices</b>	<ul style="list-style-type: none"> <li>Switches, relays, circuit breakers, electromagnetic, thermal and bi-metallic contactors. Ratings, applications, symbols, basic principle of operation.</li> </ul>	4

**Evaluation Strategies:**

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Assignments	10%	--/--/----
	Final Exam	50%	--/--/----

**Teaching Methodology:**

- ❖ Lecture and presentations

**Text Books & References:****Textbook:**

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# Engineering Program

Specialization	Common
Course Number	20301112
Course Title	Electrical Engineering Lab
Credit Hours	1
Theoretical Hours	0
Practical Hours	3



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008



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**Brief Course Description:**

DC and AC circuits. Current and voltage measurements. Simple electronic circuits. DC and AC machines. Single-phase transformers. Protection devices and circuits.

**Course Objectives:**

1. To use measuring devices
2. To distinguish different types of electrical machines
3. To distinguish different types of control elements and protection devices
4. To practice electrical wiring



**Detailed Course Description:**

Lab Number	Lab Name	Lab Content	Time Needed
1.	Series and parallel DC circuits	<ul style="list-style-type: none"> <li>Current and voltage measurements. Voltage and current dividers</li> </ul>	
2.	Power measurements in DC circuits	<ul style="list-style-type: none"> <li>To check “the of conservation of energy”</li> </ul>	
3.	AC circuits	<ul style="list-style-type: none"> <li>Use oscilloscope and measuring devices to determine and measure the main features of sine waves</li> </ul>	
4.	Transformer	<ul style="list-style-type: none"> <li>Study the relationships between primary and secondary windings</li> </ul>	
5.	DC machines	<ul style="list-style-type: none"> <li>Characteristics of DC motors and generators</li> </ul>	
6.	Three-phase induction motor	<ul style="list-style-type: none"> <li>Study the characteristics of three-phase induction motors</li> </ul>	
7.	Electronic devices	<ul style="list-style-type: none"> <li>Investigate the characteristics of diodes and transistors. Build simple rectification circuits</li> </ul>	
8.	Control and protection devices	<ul style="list-style-type: none"> <li>Construct and test simple circuits to demonstrate the operation of control and protection devices</li> </ul>	

**Evaluation Strategies:**

Exams		Percentage	Date
Exams	Med term	20%	--/--/----
	Reports	30%	--/--/----
	Final Practical Exam	50%	--/--/----

**Teaching Methodology:**

- Laboratory

**Text Books & References:**

Instructional Lab. Sheets

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008